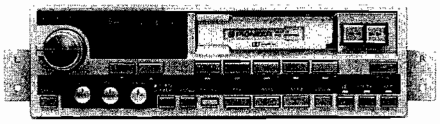
PIONEER

PION - 04723

Service Manual



ORDER NO.
CRT-447-0

CASSETTE CAR STEREO WITH FM/AM ELECTRONIC TUNER

KE-8001F

ES

FORD PART NO.
84DA-18B865-AA

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4723

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• Cassette Mechanism Unit

See the Service Manual CX-146/C (CRT-324) when servicing the cassette mechanism unit. The differences from the CX-146/C are shown below.

Exploded View (Page 14)

CX-146/C				KE-800IF/ES	
Mark	**No.**	**Part No.**	**Description**	**Part No.**	**Description**
★ ★	18.	CXM-104	Motor	CXM-160	Motor
	38.	CNL-286	P.C. Board	CNP-925	P.C. Board
★ ★	41.	CPB-102	Head	CPB-066	Head
★ ★	122.	———	———	CSN-080	Switch (FF/REW)
	123.	———	———	CNL-366	P.C. Board
	124.	———	———	PMZ20P030FMC	Screw
	125.	———	———		P.C. Board

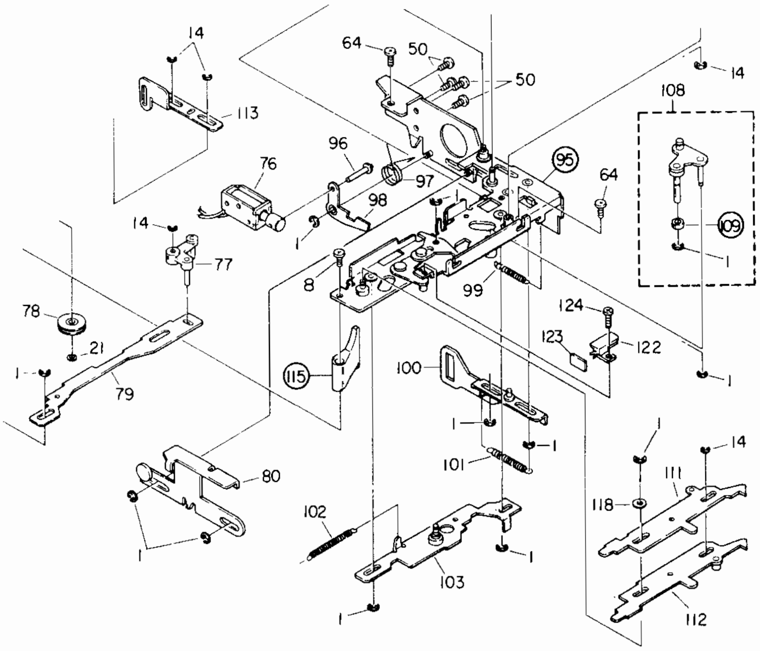

14
64
50
50
113
108
14
96
76
97
95
64
98
109
14
77
1
8
99
78
124
21
123
122
1
1
115
100
79
1
1
14
80
101
111
118
102
1
103
1
112

Fig. 1

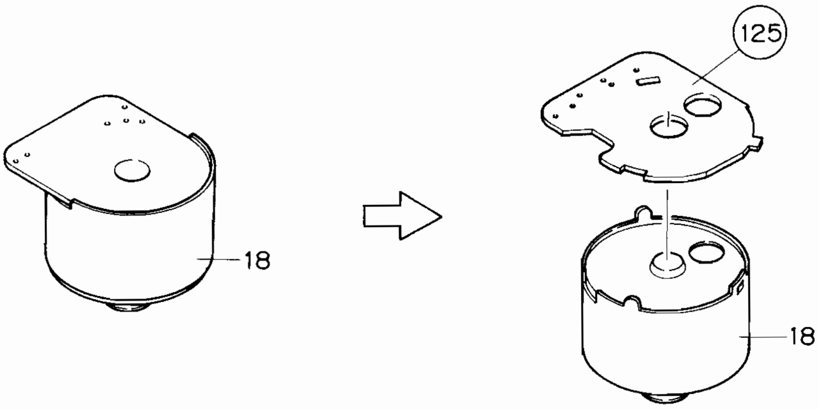


Fig. 2

1. PARTS LOCATION

NOTE:

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

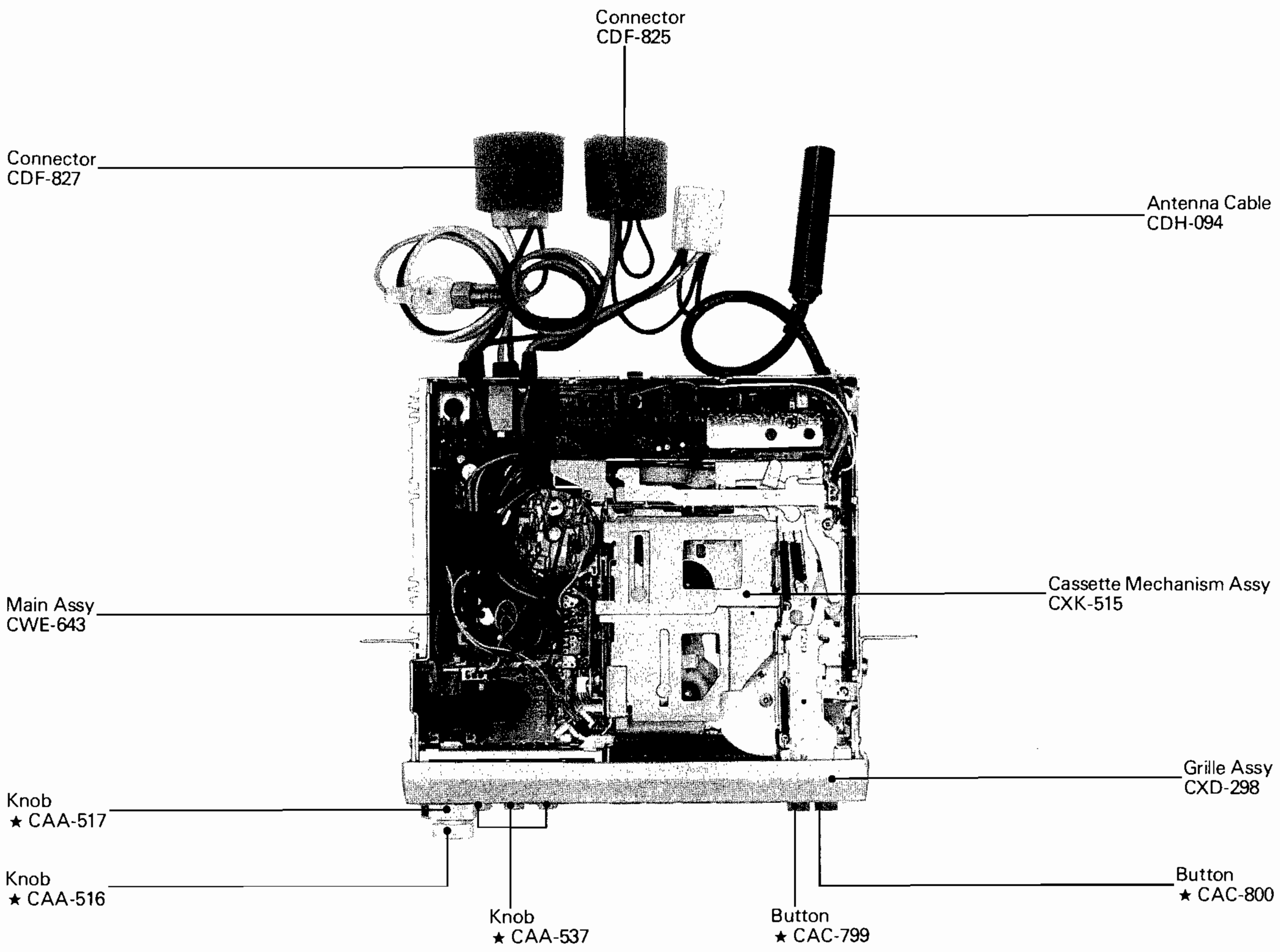

Connector
CDF-825
Connector
CDF-827
Antenna Cable
CDH-094
Cassette Mechanism Assy
CXK-515
Main Assy
CWE-643
Grille Assy
CXD-298
Knob
★ CAA-517
Knob
★ CAA-516
Button
★ CAC-800
Knob
★ CAA-537
Button
★ CAC-799

Fig. 3

2. DISASSEMBLY

• How to remove the case unit

1. Remove the two screws A, lift the back of the case and disengage the case unit by pulling backwards.

• How to remove the grille assy

1. Remove the two knobs, then unthread four screws B and remove the grille assy.

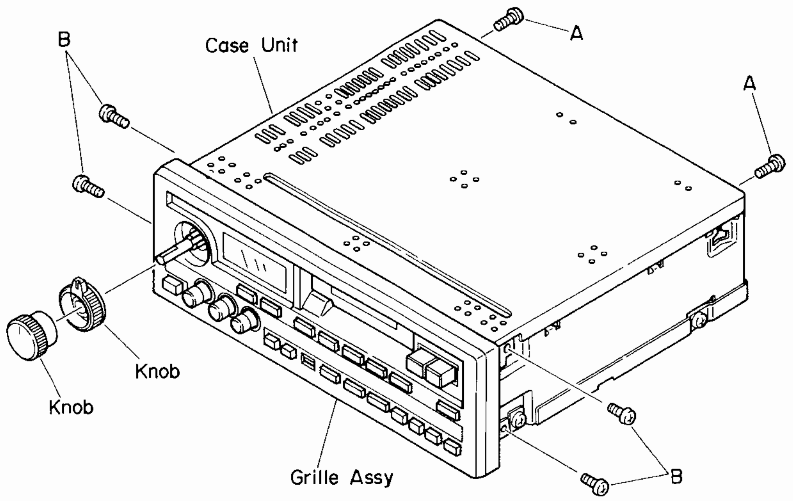

B
Case Unit
A
A
Knob
Knob
Grille Assy
B

Fig. 4

• How to remove the cassette mechanism assy

1. Unscrew four screws, then remove the cassette mechanism assy by pulling it backwards diagonally.

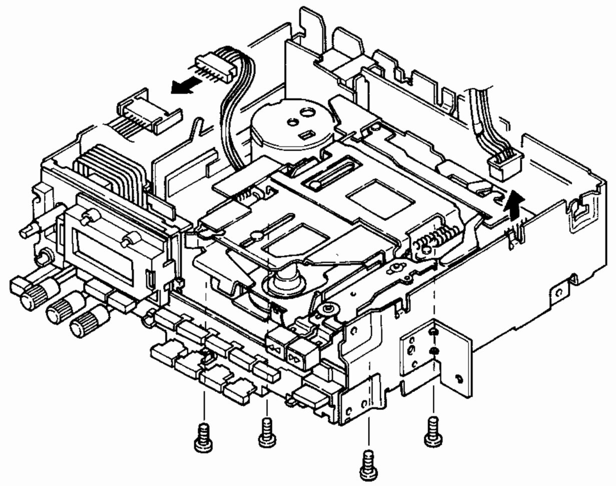


Fig. 5

3. CIRCUIT DESCRIPTION

• Block Diagram

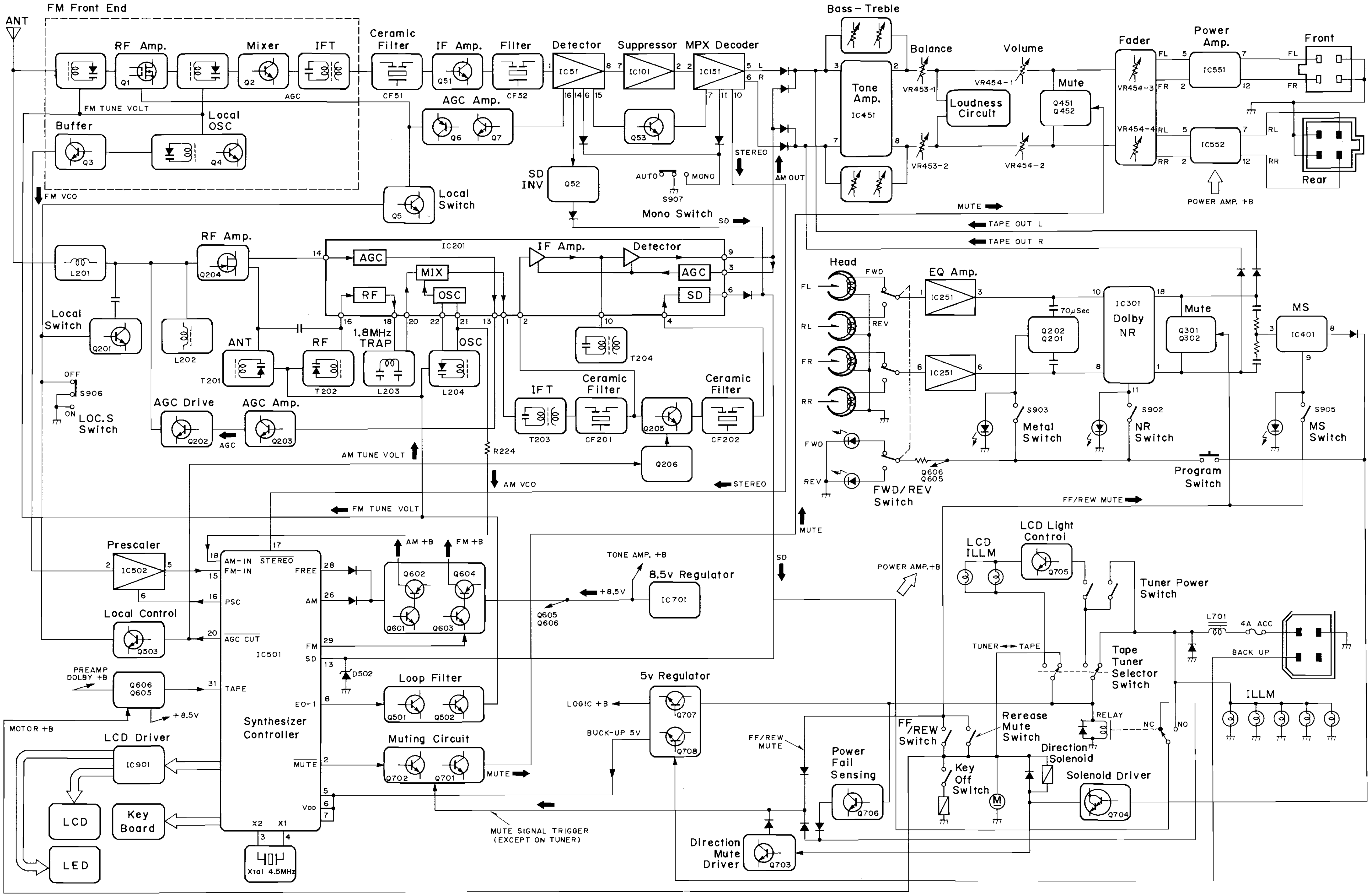

FM Front End
ANT
RF Amp.
Q1
Mixer
Q2
IFT
AGC
FM TUNE VOLT
Local OSC
Buffer
Q3
Q4
FM VCO
Ceramic Filter
CF51
IF Amp.
Q51
Filter
CF52
AGC Amp.
Q6
Q7
Detector
IC51
Suppressor
IC101
MPX Decoder
IC151
Q53
STEREO
AM OUT
SD INV
Q52
AUTO
MONO
S907
Mono Switch
SD
Local Switch
Q5
Bass−Treble
Tone Amp.
IC451
Balance
VR453-1
VR453-2
Loudness Circuit
Volume
VR454-1
VR454-2
Mute
Q451
Q452
Fader
VR454-3
VR454-4
FL
FR
RL
RR
Power Amp.
IC551
IC552
POWER AMP. +B
Front
Rear
MUTE
TAPE OUT L
TAPE OUT R
L201
RF Amp.
Q204
IC201
AGC
MIX
RF
OSC
IF Amp.
Detector
SD
Local Switch
Q201
L202
ANT
T201
RF
T202
1.8MHz TRAP
L203
OSC
L204
T204
IFT
T203
Ceramic Filter
CF201
Q205
Ceramic Filter
CF202
Q206
OFF
S906
ON
LOC.S Switch
AGC Drive
Q202
AGC Amp.
Q203
AGC
AM TUNE VOLT
R224
AM VCO
STEREO
FM TUNE VOLT
Head
FWD
REV
EQ Amp.
IC251
IC251
70μSec
Q202
Q201
IC301
Dolby NR
Mute
Q301
Q302
MS
IC401
S903
Metal Switch
S902
NR Switch
S905
MS Switch
Program Switch
FWD/REV Switch
Q606
Q605
FF/REW MUTE
MUTE
SD
Prescaler
IC502
Local Control
Q503
PREAMP DOLBY +B
Q606
Q605
+8.5V
MOTOR +B
AM-IN
FM-IN
STEREO
FREE
PSC
AM
AGC CUT
IC501
FM
SD
TAPE
EO-1
Synthesizer Controller
MUTE
VDD
X2
X1
Xtal 4.5MHz
AM +B
FM +B
Q602
Q604
Q601
Q603
D502
Loop Filter
Q501
Q502
Muting Circuit
Q702
Q701
MUTE
MUTE SIGNAL TRIGGER (EXCEPT ON TUNER)
TONE AMP. +B
8.5v Regulator
IC701
+8.5V
Q605
Q606
5v Regulator
LOGIC +B
BUCK-UP 5V
Q707
Q708
LCD Driver
IC901
LCD
Key Board
LED
POWER AMP.+B
LCD ILLM
LCD Light Control
Q705
Tuner Power Switch
L701
4A
ACC
BACK UP
TUNER ⟷ TAPE
Tape Tuner Selector Switch
ILLM
RELAY
NC
NO
FF/REW MUTE
FF/REW Switch
Rerease Mute Switch
Direction Solenoid
Solenoid Driver
Q704
Key Off Switch
M
Power Fail Sensing
Q706
Direction Mute Driver
Q703

Fig. 6

• Level Diagram

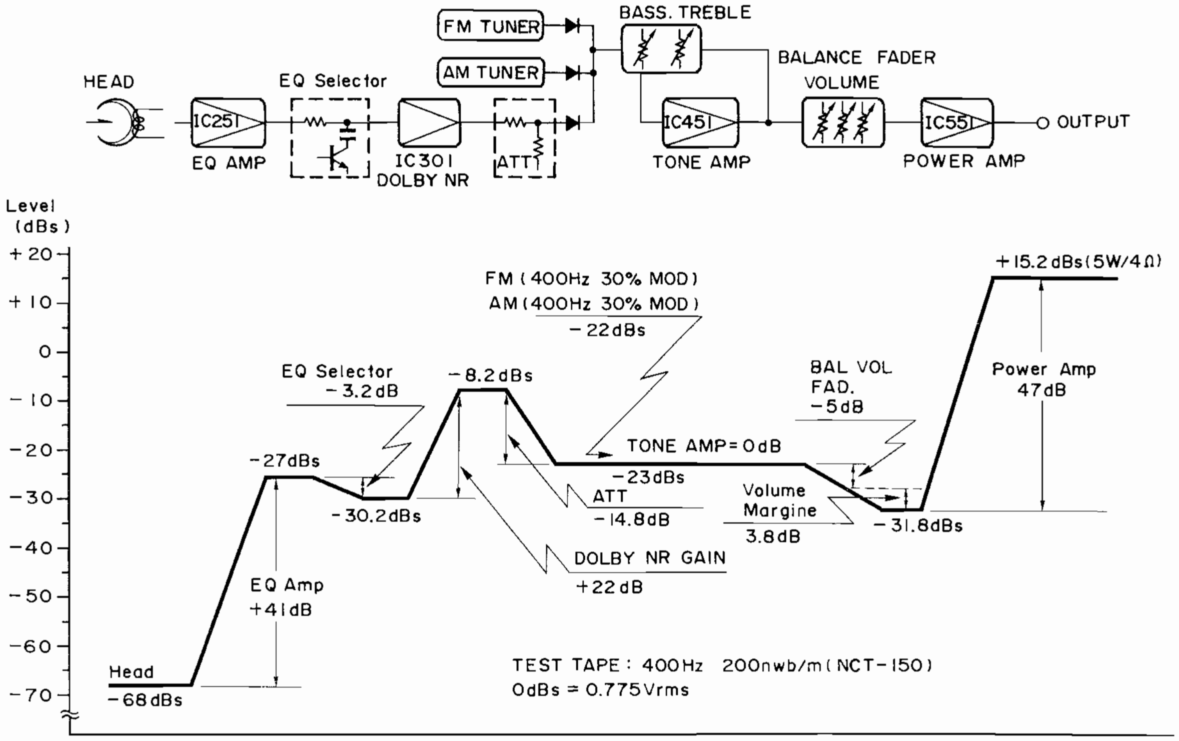


Fig. 7

• Power Supply Circuit

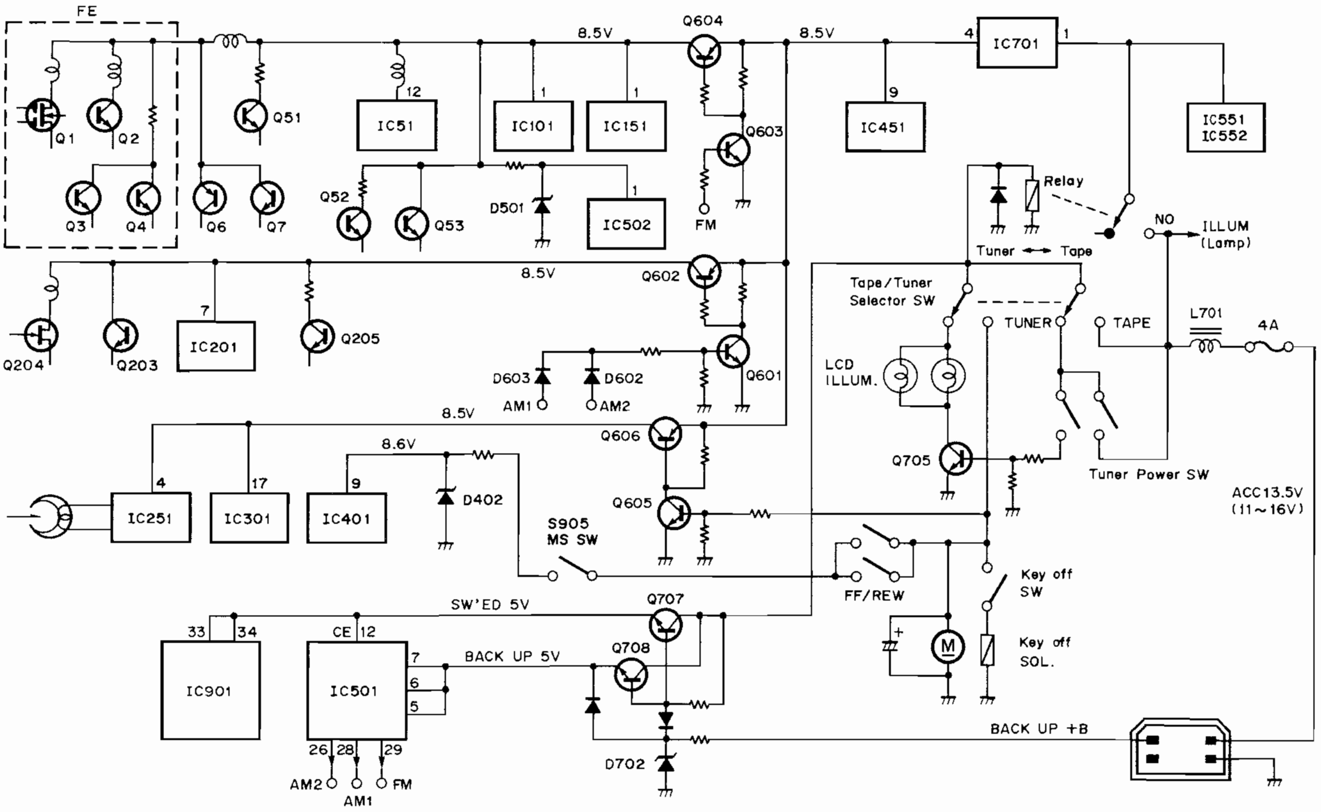

FE
Q1
Q2
Q3
Q4
Q51
Q6
Q7
8.5V
Q604
8.5V
12
IC51
1
IC101
1
IC151
Q603
4
IC701
1
9
IC451
IC551
IC552
Q52
Q53
D501
1
IC502
FM
Relay
NO
ILLUM (Lamp)
Tuner ↔ Tape
8.5V
Q602
Q204
Q203
7
IC201
Q205
Tape/Tuner Selector SW
TUNER
TAPE
L701
4A
D603
AM1
D602
AM2
Q601
LCD ILLUM.
8.5V
Q606
8.6V
4
IC251
17
IC301
9
IC401
D402
Q605
S905 MS SW
Q705
Tuner Power SW
ACC13.5V (11~16V)
FF/REW
Key off SW
Key off SOL.
M
SW'ED 5V
Q707
33
34
IC901
CE 12
IC501
7
6
5
BACK UP 5V
Q708
BACK UP +B
D702
26
28
29
AM2
AM1
FM

Fig. 8

• Main Functions

1. Reception frequency range

- FM . . . . 87.5~108.00MHz
  100kHz increments (seek, manual)
- AM1, 2 . . . . 522~1,629kHz
  9kHz increments (seek, manual)

2. Tuning

- When the Manual/Seek Select button is set to manual mode the UP ▲ /DOWN ▼ tuning buttons allow one step/one push manual tuning.
  If the button is kept pressed for approx. 0.5 seconds or more, the frequency will continuously increase or decrease depending on which button is pressed.
- When the Manual/Seek Select button is set to seek mode, the UP ▲ /DOWN ▼ tuning buttons allow auto search tuning in both directions.
- Preset tuning using the Memory button (preset buttons)

3. Memory

- FM5 stations, AM10 stations (AM1: 5 stations, AM2: 5 stations)
- The last channel memory facility allows reception of the station previously tuned in, when the power switch is turned on or when the unit is switched from tape to tuner mode.

• Frequency Synthesizer Section (FM)

During FM reception, a combination of synthesizer control IC501 and prescaler IC502 (the frequency dividing ratio is controlled to 1/16 or 1/17 by IC501) allow the slower counter method.

The FM VCO is frequency-divided to a ratio of 1/16 or 1/17 by prescaler IC502. The ratio divided by IC502 is controlled by the control voltage from pin 16 of IC501.

An output of 4.5MHz (X501) which becomes a clock pulse for IC501 is divided into 1/180 by the reference frequency divider to produce 25kHz (all this is processed inside IC501). Since the reception frequency is 87.5~108.0MHz and the intermediate frequency (IF) is 10.7MHz, the oscillator frequency of VCO will be 98.2~118.7MHz. This VCO signal is fed to pin 2 of IC501 where it is divided and output from pin 5, which in turn is applied to pin 15 of IC501.

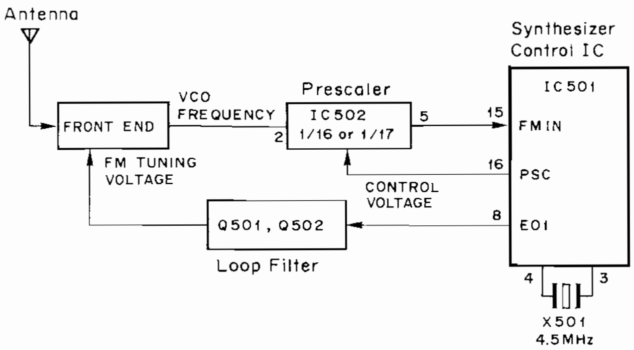


Fig. 9

As the overall frequency division ratio is 3928~4748, the output of the programmable counter inside IC501 will be 25kHz. This output is compared in phase with a reference frequency of 25kHz by the phase detector in IC501, and is output to pin 11 of IC501.

The loop filter consisting of Q501 and Q502 converts the signal into a DC voltage signal which in turn controls the tuning circuit in the front end section as a tuning voltage.

• Frequency Synthesizer Section (AM1, AM2)

The AM section employs a direct frequency dividing method. So that the reception frequency is incremented in 9kHz, the frequency of the phase comparator is 9kHz. This is produced by dividing 4.5MHz (the output of X501), a clock frequency of IC501 to 1/500. Since the reception frequency range is 522~1,629kHz and the intermediate frequency is selected at 450kHz, the frequency of the local oscillator (VCO) will be 972~2079kHz.

This output is output from pin 21 of IC201 and enters pin 18 of IC501.

If the frequency dividing ratio of the programmable counter in IC501 is set to 108~231, the output will be 9kHz. This frequency is compared in phase with a reference frequency of 9kHz by the phase comparator and is output from pin 8 of IC501.

The signal is converted into a DC voltage signal by the loop filter consisting of Q501 and Q502, which in turn controls the tuning circuit as a tuning voltage.

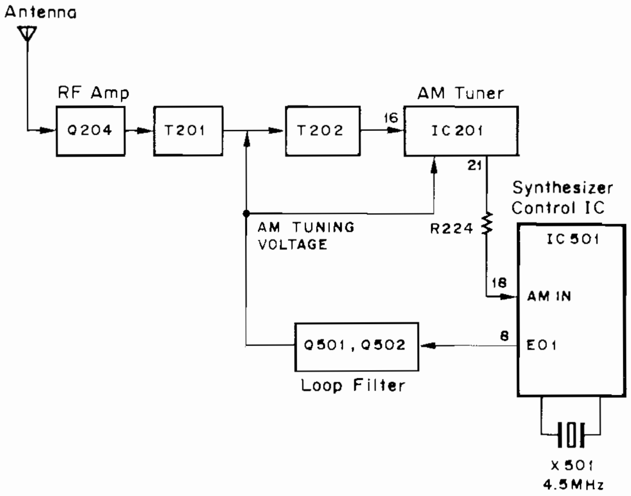
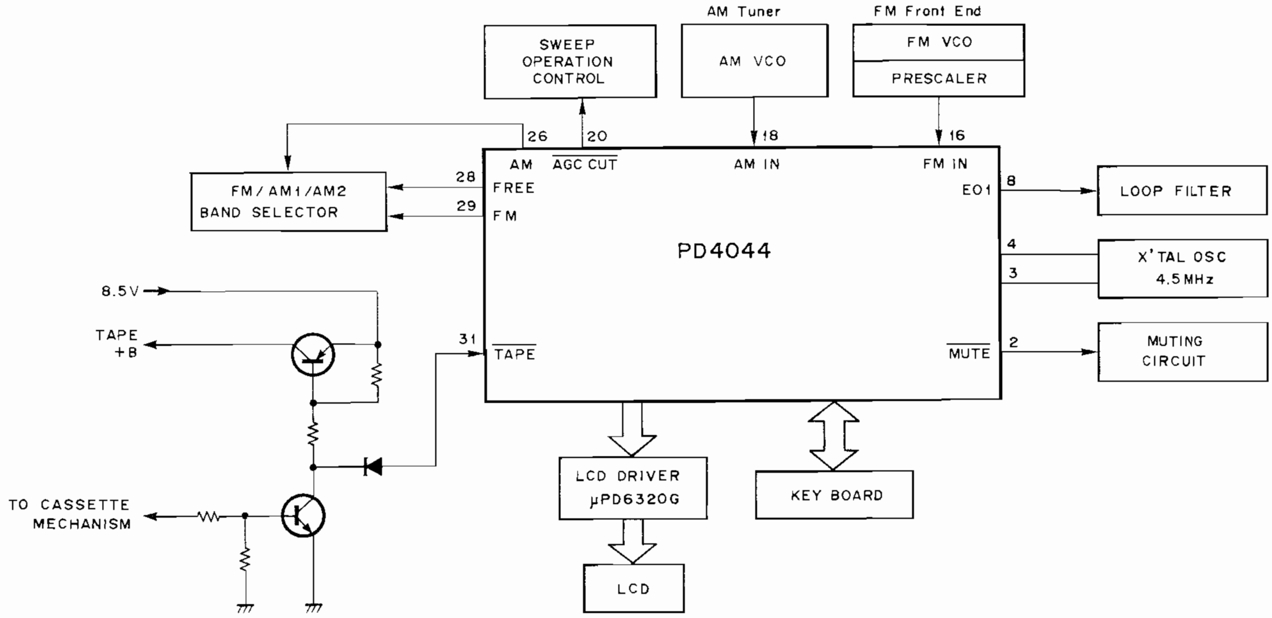


Fig. 10

• The Functions of Control IC (PD4044)

PD4044 is a 52-pin flat package C-MOS LSI which controls 25kHz incremental tuning for FM, 9kHz incremental tuning for AM. In combination with LCD driver IC (μPD6320G), this PLL type frequency synthesizer tuner control IC makes possible 7-segment digital display. Since this IC employs a static method for the display driver, the performance of the receiver is improved.

The PD4044 can be in either of the following two modes depending on the state of pin 31. When pin 31 is high, the PD4044 is in the Tuner mode, operating as a PLL synthesizer tuner control IC. When the pin is low, the IC is in the Tape mode, inhibiting its functions as a PLL synthesizer tuner control IC.
If a low level is output from pin 20 while sweeping in the Seek mode, the output signal generates a signal for switching LOC/DX. The signal is also used to inhibit Stop signals (AM).
In the Seek mode, the PD4044 detects whether the PLL synthesizer tuner loop is locked and performs a sweep operation. If, for some reason, the loop is not locked, the sweep operation will not be performed.
Because loop locking is not detected in the manual mode, the sweep operation can be performed by pressing the Up or Down button for more than 0.5 sec. Sweeping will be continued until the button is released.
When a button related to the tuner is pressed, the PD4044 outputs a pulse of about 40 msec from pin 32. This pulse is useful in checking the wiring that connects the buttons and the IC. Pressing a button that does not cause a state transition does not generate a pulse, however. For example, if you press the preset button of the station currently tuned to, no pulse will be generated. Or, if you press a band button (FM, AM1, or AM2) while the tuner is playing in that band, no pulse will be generated.

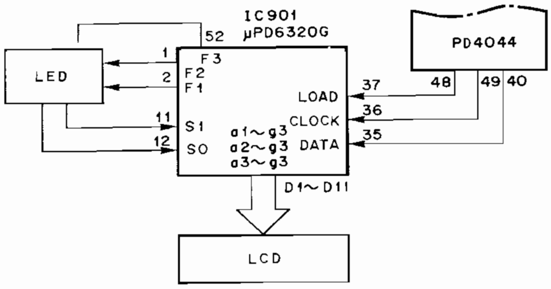


AM Tuner
FM Front End
SWEEP OPERATION CONTROL
AM VCO
FM VCO
PRESCALER
26
20
18
16
AM
AGC CUT
AM IN
FM IN
FM/AM1/AM2 BAND SELECTOR
28
29
FREE
FM
EO1
8
LOOP FILTER
4
3
X'TAL OSC 4.5MHz
PD4044
8.5V
TAPE +B
31
TAPE
MUTE
2
MUTING CIRCUIT
TO CASSETTE MECHANISM
LCD DRIVER μPD6320G
KEY BOARD
LCD

Fig. 11

• The Functions of LCD Driver IC (μPD6320G)

μPD6320G is a 52-pin flat-package C-MOS LSI which drives LCD (liquid crystal display) in static method. This LSI incorporates a 32-bit shift register, latch circuit, 7-segment decoder, oscillation circuit, and LED driver.
Displaying preset memory address on the LED.



IC901
μPD6320G
52
LED
1
2
F3
F2
F1
11
12
S1
SO
a1~g3
a2~g3
a3~g3
LOAD
CLOCK
DATA
37
36
35
PD4044
48
49
40
D1~D11
LCD

Fig. 12

• The Switching Circuit of The Tuner Power Supply

When any one of AM1, AM2 and FM is received, "H" signal is output from pins 28, 26 and 29 of control IC501 respectively. This output is switched by the switching circuit consisting of Q601 through Q604 so that a respective power is supplied to the respective circuitry of AM1, AM2 and FM.

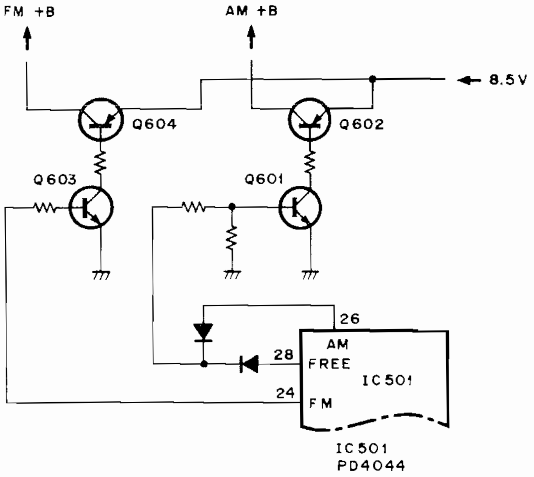


Fig. 13

• Operation of FM Section

1. Front end section
   The front end section consists of a single-tuning 2-stage RF amplifier, mixer and VCO (voltage controlled oscillator) provided with buffers.
2. IF section
   The intermediate frequency is amplified by IF amps (Q51) using two ceramic filters in between.
3. IF detector section
   A double-tuning quadrature detection is performed by IC LA1140B using IF amp and L52, T51 and T52 to obtain an audio frequency output.
4. PNS section
   This is a pulse noise suppressor using IC LA2110 and CR composite part CR101 which comprises filters.
5. Multiplexer section
   Stereo multiplexing is performed by IC LA3376P. This IC does not operate the stereo circuit in the absence of current flowing through the stereo indicator terminal (pin 10). The output for pilot subcarrier canceller appearing at pin 13 is enabled during both stereo and monaural operation.
6. AGC amplifier
   The difference in level between the AGC output voltage (0∼4V) appearing at pin 16 of IC LA1140B and the voltage (0∼6V) required for the front end section is corrected by the DC amplifier consisting of Q6 and Q7.
7. Muting of weak incoming signals
   IC LA1140B develops a DC voltage at pin 14 when the input is weak or detuned. When this voltage is applied to pin 6 through the filter consisting of capacitors and resistors, the attenuator goes into operation.
8. Separation control, high frequency cut control
   Stereo separation and high frequency attenuation are made possible by applying the output voltage at pin 15 of IC LA1140B to pins 7 and 8 of IC LA3376P via buffer Q53 VR152 serves as a level adjustment of this control.
9. Stop signal
   The stop signal for the seek operation uses a voltage developed at pin 14 of IC LA1140B. (During broadcast reception, the voltage is at 0V).
   The stop signal is phased by Q52 and applied to pin 13 of IC501.
10. Local station seeking
    While seeking strong signal stations, the gain of the front end is decreased by making the voltage at AGC terminal (G2 of Q1) in the front end 0V by Q5.
11. Mono/stereo (ARC)
    When the Mono button is pressed, pin 6 of IC LA1140B is grounded through D52, and pin 11 of IC LA3376P is grounded through D152. Through this operation, the weak signal muting function of IC LA1140B and the stereo demodulation function of IC LA3376P are suppressed.
    When the Mono button is not pressed, the weak signal muting function of IC LA1140B is enabled, and the separation control, high frequency control, and automatic reception control function.

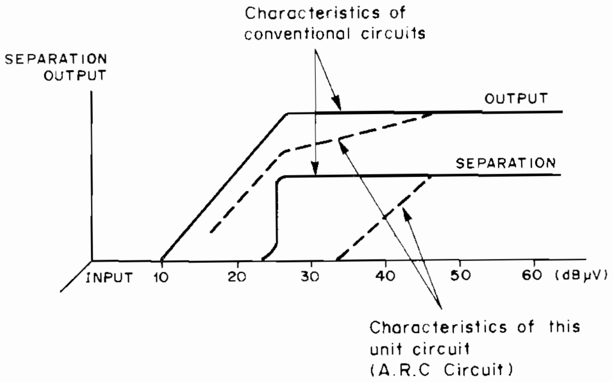


Fig. 14

• Operation of AM Section

IC PA3016 used in this unit is designed for electronic tuning and provided with the output circuit of the stop signals for seeking and VCO buffer. Its feature includes a wide-band AGC.

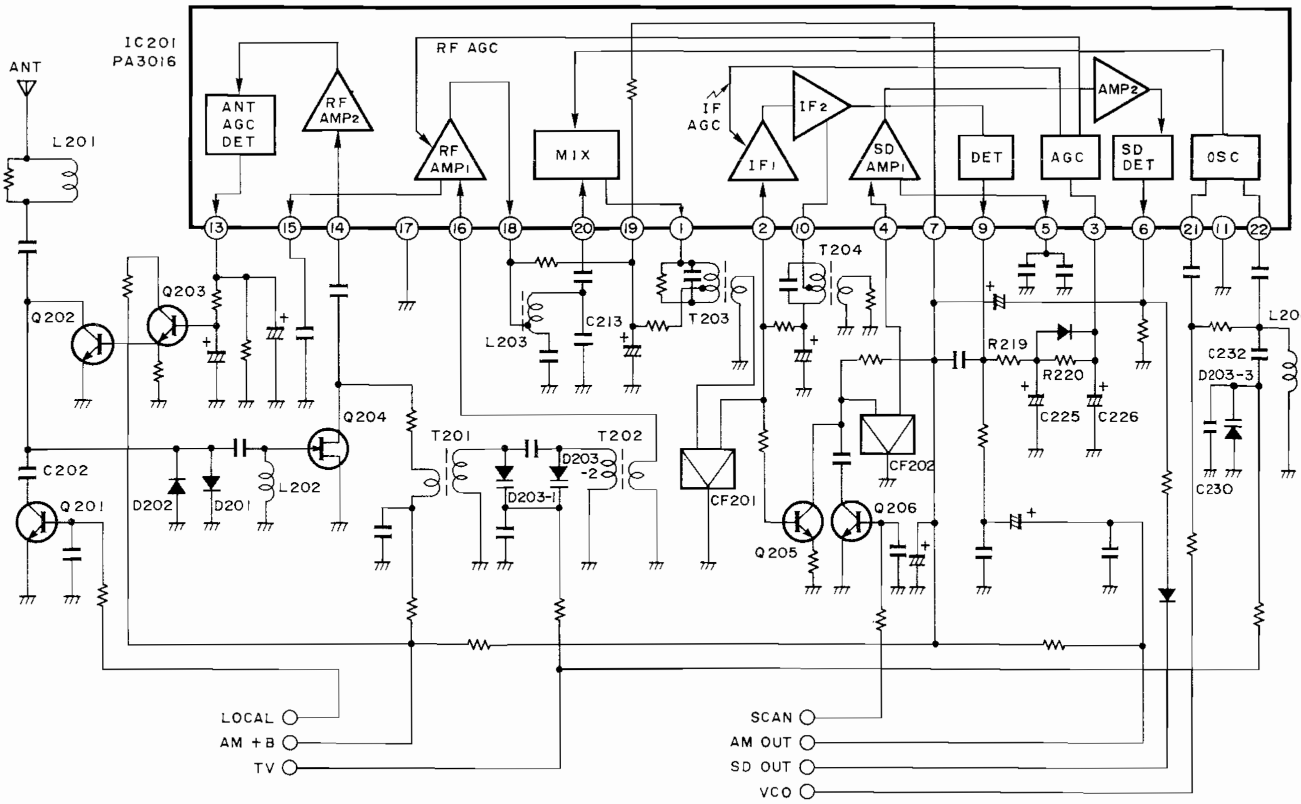
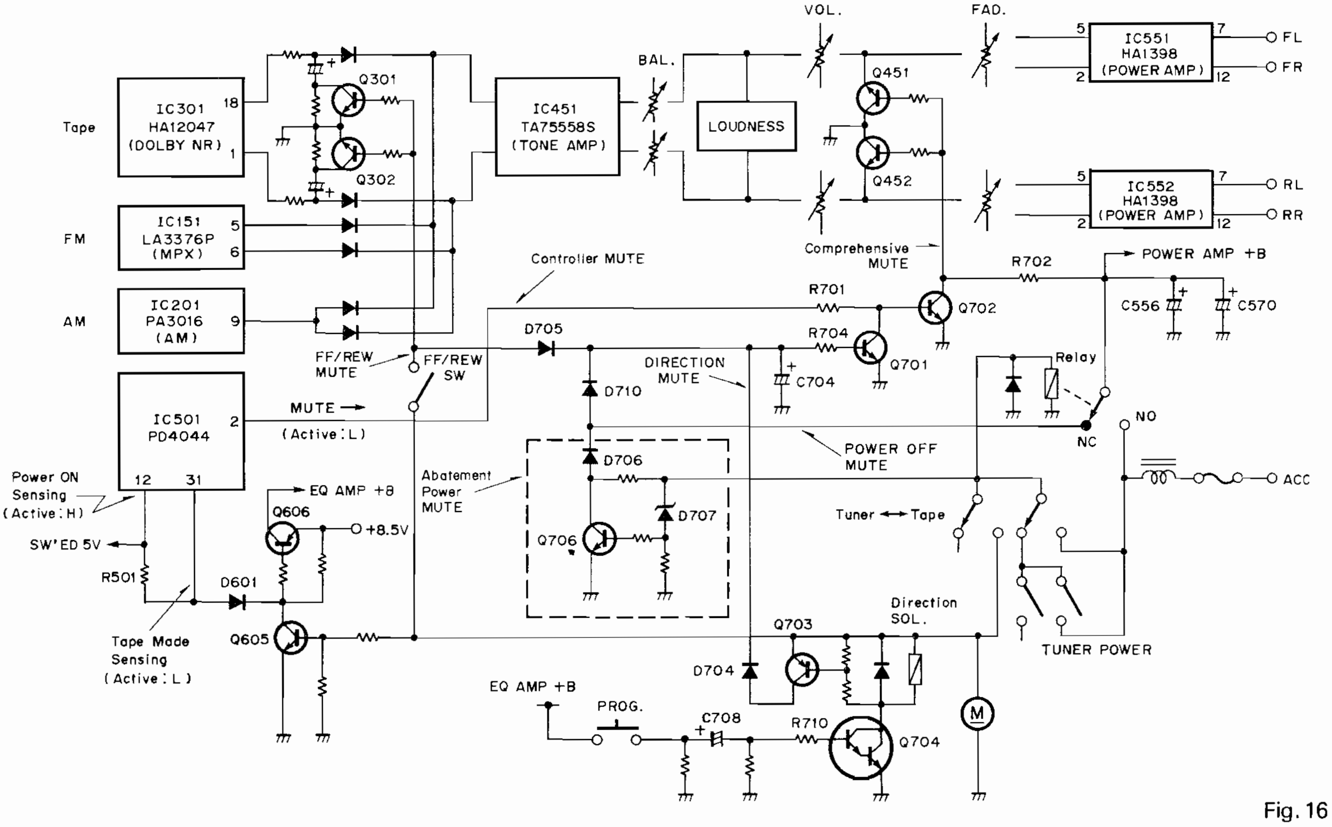

IC201
PA3016
ANT
L201
ANT AGC DET
RF AMP2
RF AGC
RF AMP1
MIX
IF AGC
IF2
IF1
SD AMP1
AMP2
DET
AGC
SD DET
OSC
13
15
14
17
16
18
20
19
1
2
10
4
7
9
5
3
6
21
11
22
Q202
Q203
T204
T203
C213
L203
R219
R220
C225
C226
L204
C232
D203-3
C230
Q204
T201
T202
D203-2
D203-1
C202
Q201
D202
D201
L202
CF201
CF202
Q205
Q206
LOCAL
AM +B
TV
SCAN
AM OUT
SD OUT
VCO

Fig. 15

1. RF amplifier section
   This section performs a single-tuning 2-stage RF amplification. The first stage is a narrow-band amplifier section consisting of Q204 and its load, i.e., resonance circuit (inductance of T201 and capacitance of varicap diode D203-1). The second stage is a section consisting of RF amplifier 1 inside the IC and its load, or resonance circuit (inductance of T202 and capacitance of D203-2).
   The signal from RF AMP1 is output to pin 18, flows through the trap and L.P.F., and fed to the mixer. L203 and C213 constitute a trap and L.P.F. of 1800kHz, which improves the tweet characteristic.
2. VCO section
   The VCO (voltage-controlled oscillator) oscillates at its resonant frequency by the feedback circuit from pin 21 to pin 22 and the resonant circuit connected to pin 22.
   The resonant frequency is determined by the inductance of L204 and the composite capacitance of C232, C230 and D203-3. C232 is a padding capacitor connected in series with capacitance-varying varicap diode D203-3, and C230 is a capacitor connected in parallel with varicap diode depending on its grade. All this contributes to better tracking with the RF stage.
3. Mixer section
   The VCO output frequency from the VCO section and the input signal from RF amp 1 are mixed together at the mixer section to produce the IF component (450kHz).
4. IF section
   The intermediate frequency section consists of the IF filter (450kHz) by T203 and CF201, the IF amp 1, and the IF filter by T204.
5. Detector section
   Pin 2 is connected to the IF amp 1, IF amp 2 and detector and provides an output to pin 9, audio output. This output contains both audio frequency component (AC) and DC component.
6. AGC section (AGC by the reception frequency)
   The DC component of the detector output at pin 9 is detected by AGC amp at pin 3 by passing it through the filter consisting of R219, R220, C225 and C226, The IF AGC starts operating when the antenna input becomes 25 dBμV, and the amount of attenuation becomes constant after the antenna input has become 50 dBμV. In the antenna input value range of 50 to 70 dBμV, the RF AGC operates. When the antenna input is greater than 70 dBμV, the ANT AGC (wide-band AGC) operates.

7. AGC section (wide-band AGC)
   The wide-band AGC is to control the gain of the RF amplifier section when the input RF level at pin 14 is high.
   This is intended to prevent interference due to the saturations of RF amp Q204, RF amp 2 in the IC, etc.
   The output from RF amp 2 flows through ANT AGC DET, turns Q203 and Q202 on, and attenuates the input to Q204.
8. Stop signal
   The stop signal for seek operation is produced by extracting the IF signal from the output of CF201 and amplify its level by Q205.
   This signal is connected via 450kHz filter CF202 from pin 4 to SD amp 1, 2 to SD DET. This output appears at pin 6 and becomes 0V during reception.
   (During normal reception, the SD output becomes 0 because Q206 turns on and disables the amplification by Q205.)
9. Local station/distant station seek
   During local station seek, Q201 turns on, whereby C202 is grounded. The impedance of C202 allows attenuation in the antenna system.

• Muting Circuit



VOL.
FAD.
BAL.
Tape
IC301
HA12047
(DOLBY NR)
18
1
Q301
Q302
IC451
TA75558S
(TONE AMP)
LOUDNESS
Q451
Q452
IC551
HA1398
(POWER AMP)
5
2
7
12
FL
FR
IC552
HA1398
(POWER AMP)
RL
RR
FM
IC151
LA3376P
(MPX)
5
6
AM
IC201
PA3016
(AM)
9
Controller MUTE
Comprehensive MUTE
R702
POWER AMP +B
R701
Q702
C556
C570
D705
R704
Q701
FF/REW MUTE
FF/REW SW
DIRECTION MUTE
C704
D710
Relay
IC501
PD4044
2
MUTE
(Active: L)
NO
NC
POWER OFF MUTE
D706
Power ON Sensing (Active: H)
12
31
EQ AMP +B
Abatement Power MUTE
D707
ACC
Q606
+8.5V
Tuner ←→ Tape
SW'ED 5V
Q706
R501
D601
Direction SOL.
Q703
TUNER POWER
Tape Mode Sensing (Active: L)
Q605
D704
EQ AMP +B
PROG.
C708
R710
Q704
M

Fig. 16

With KE-8001F, muting is activated in the following cases:

- Power on/off
  - ① By the tuner power switch
  - ② When a cassette tape is loaded/ejected.
  - ③ The ACC line is abnormally low or off.
- Change of tuner mode
  - ④ When the band is changed by the band switch.
  - ⑤ When the preset memory button is pressed.
  - ⑥ When the up or Down button is pressed.
- Change of tape mode
  - ⑦ In FF or REW mode (MS on or off)
  - ⑧ When the program button is pressed.

Of the cases above, ❶, ❷, ❹, ❺ and ❻ output a muting signal from PLL synthesizer controller IC501. In ❶ and ❷, muting signals for other purposes are also generated.

❶ Tuner power switch ON, OFF

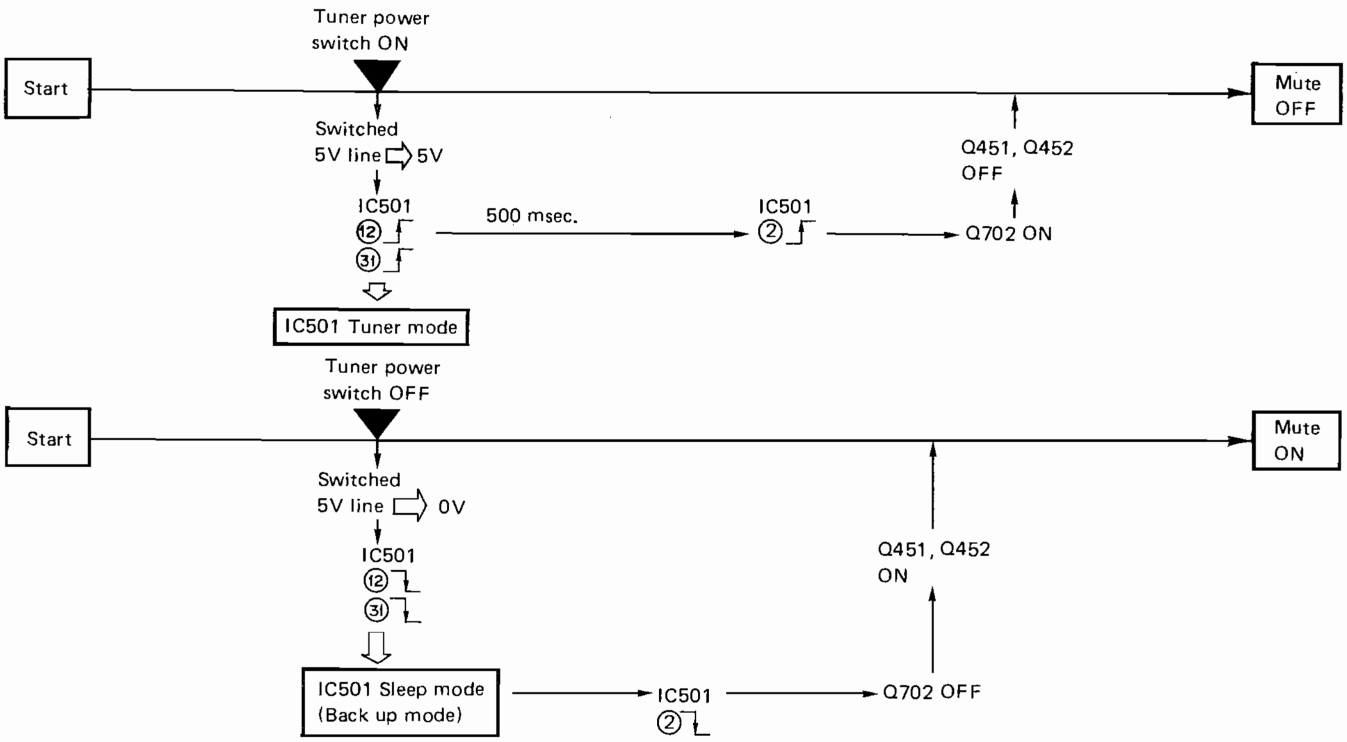
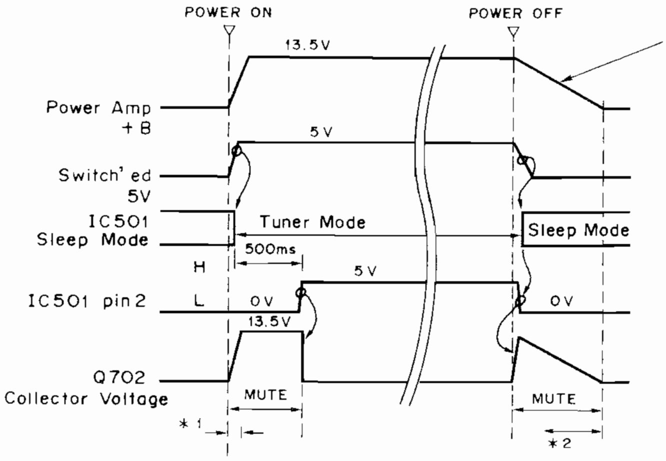

Tuner power switch ON
Start
Mute OFF
Switched 5V line ⇨ 5V
Q451, Q452 OFF
IC501 ⑫ ㉛
500 msec.
IC501 ②
Q702 ON
IC501 Tuner mode
Tuner power switch OFF
Start
Mute ON
Switched 5V line ⇨ 0V
Q451, Q452 ON
IC501 ⑫ ㉛
IC501 Sleep mode (Back up mode)
IC501 ②
Q702 OFF

Fig. 17


POWER ON
POWER OFF
13.5V
Power Amp +B
5V
Switch'ed 5V
IC501 Sleep Mode
Tuner Mode
Sleep Mode
500ms
H
L
IC501 pin2
5V
0V
0V
13.5V
Q702 Collector Voltage
MUTE
MUTE
*1
*2

The curve goes down gradually due to the discharge of C556 and C570.

Fig. 18

Notes:

*1)Low voltage mute functions at the same time.

*2)Low voltage mute and power off mute function at the same time.

❷ Loading and Ejecting a Cassette Tape

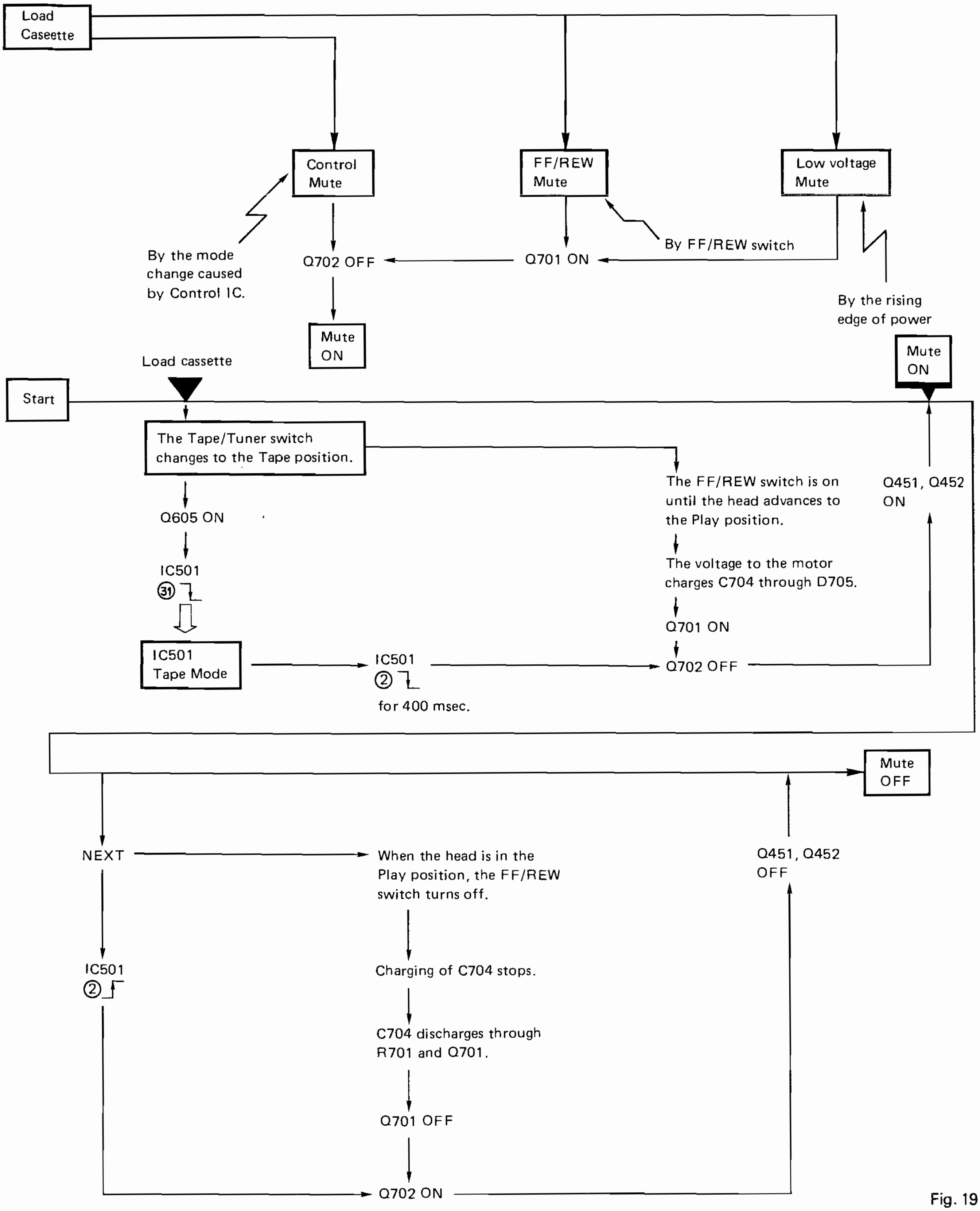

Load Caseette
Control Mute
FF/REW Mute
Low voltage Mute
By the mode change caused by Control IC.
Q702 OFF
Q701 ON
By FF/REW switch
By the rising edge of power
Mute ON
Load cassette
Mute ON
Start
The Tape/Tuner switch changes to the Tape position.
The FF/REW switch is on until the head advances to the Play position.
Q451, Q452 ON
Q605 ON
IC501 ㉛
The voltage to the motor charges C704 through D705.
Q701 ON
IC501 Tape Mode
IC501 ② for 400 msec.
Q702 OFF
Mute OFF
NEXT
When the head is in the Play position, the FF/REW switch turns off.
Q451, Q452 OFF
IC501 ②
Charging of C704 stops.
C704 discharges through R701 and Q701.
Q701 OFF
Q702 ON

Fig. 19

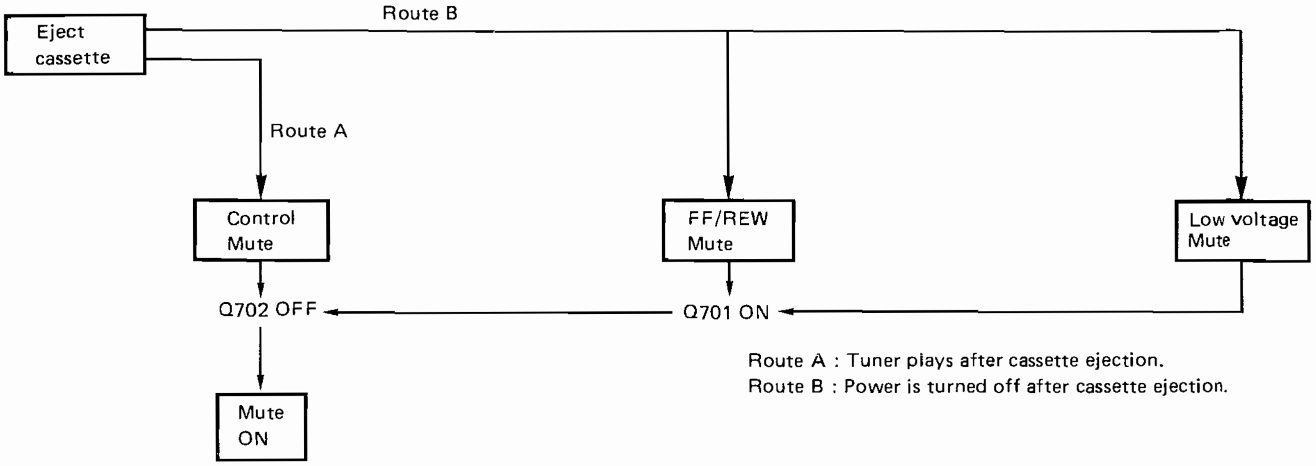

Route B
Eject cassette
Route A
Control Mute
FF/REW Mute
Low voltage Mute
Q702 OFF
Q701 ON
Mute ON
Route A : Tuner plays after cassette ejection.
Route B : Power is turned off after cassette ejection.

Fig. 20

- When the tuner power switch is on:

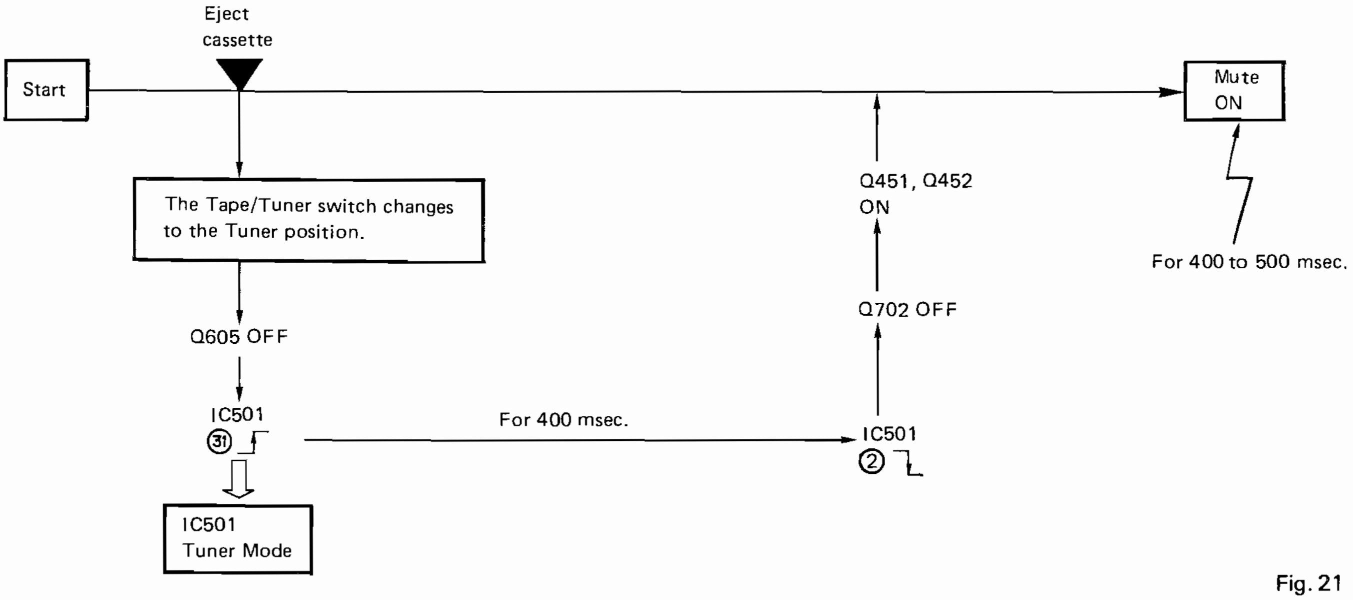

Eject cassette
Start
Mute ON
The Tape/Tuner switch changes to the Tuner position.
Q451, Q452 ON
For 400 to 500 msec.
Q702 OFF
Q605 OFF
IC501 ㉛
For 400 msec.
IC501 ②
IC501 Tuner Mode

Fig. 21

- When the tuner power switch is off:

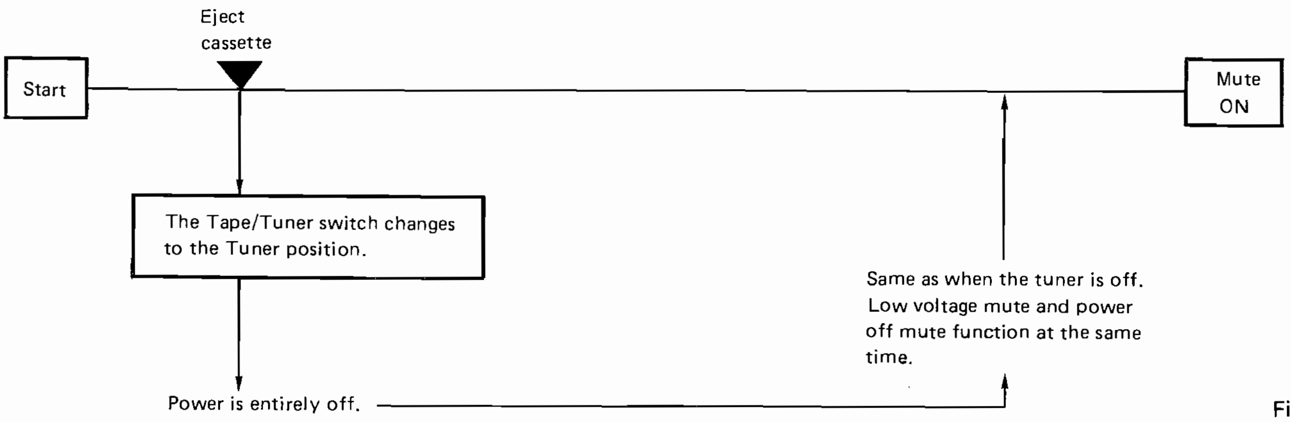

Eject cassette
Start
Mute ON
The Tape/Tuner switch changes to the Tuner position.
Same as when the tuner is off. Low voltage mute and power off mute function at the same time.
Power is entirely off.

Fig. 22

❸ Abnormally low voltage at the ACC line (Low voltage mute)

The Low Voltage Mute circuit consists of an 8.2-volt-zenor diode (D707), a transistor (Q706), and three resistors. Q706 turns on when the voltage between the base and emitter is 0.65 to 0.7V. Because the base is connected through D707 to the input terminal, however, Q706 is off when the input terminal is about 9V or less, and on when the terminal is greater than 9V. When Q706 is off, the input terminal is connected via R716 to the output terminal. When Q706 is on, the output terminal produces 0V.

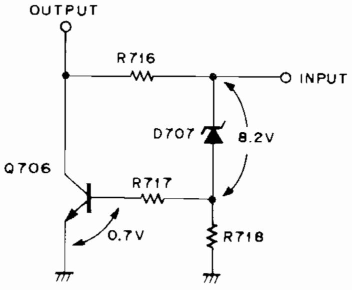
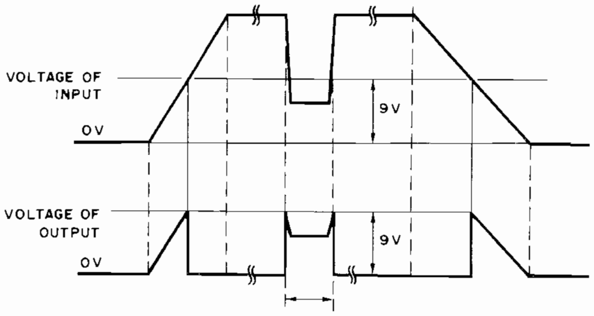

OUTPUT
R716
INPUT
D707
8.2V
Q706
R717
0.7V
R718

Fig. 23



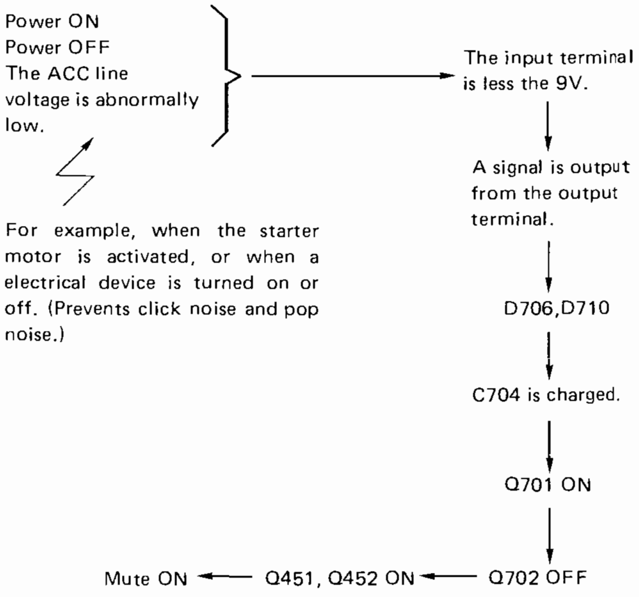
The voltage of the ACC line is low

Fig. 24

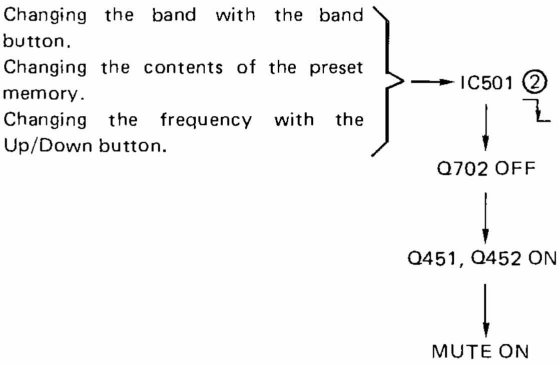
Since the input terminal is connected to the Tape/tuner switch, when this model operates, the model is connected to the ACC line. When the ACC line is lower than 9V, therefore, the output terminal sends a signal as shown in the figure above. The same signal is output at power on or off.

- **Power Off Mute (Relay mute)**

This muting circuit supplements the muting operation by the controller IC, the low voltage mute, and the power off mute. When the power is turned off, relay RL1 closes, which applies the voltage charged in C556 and C570 to C704 via D710, and then turns Q701 on and Q702 off. Q451 and Q452 are then turned on, activating the muting circuit. Because this muting circuit employs the discharge of C556 and C570, it provides muting for a long time without requiring a backup power supply. Thus, the circuit operates even after the muting by the controller IC and the low voltage mute are off, and until the power amplifier is off.


Power ON
Power OFF
The ACC line voltage is abnormally low.
For example, when the starter motor is activated, or when a electrical device is turned on or off. (Prevents click noise and pop noise.)
The input terminal is less the 9V.
A signal is output from the output terminal.
D706,D710
C704 is charged.
Q701 ON
Q702 OFF
Q451, Q452 ON
Mute ON

❹ to ❻ Changing tuner operation mode

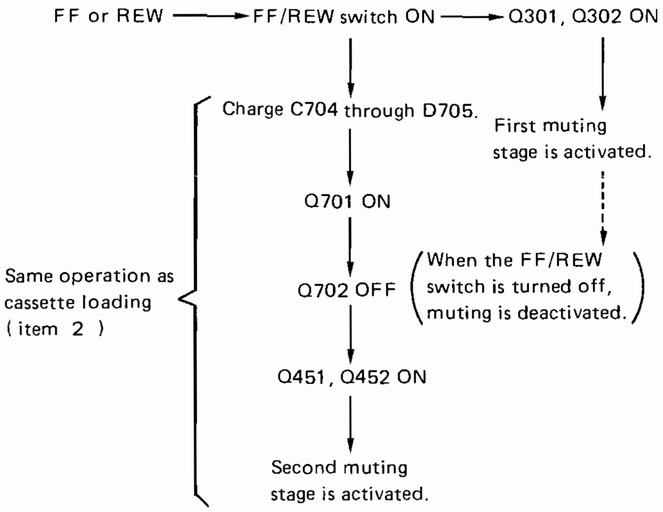

Changing the band with the band button.
Changing the contents of the preset memory.
Changing the frequency with the Up/Down button.
IC501 ②
Q702 OFF
Q451, Q452 ON
MUTE ON

- **Mute time**

Changing the band . . . . Approx. 400 msec
Changing the preset memory . . . . Approx. 150 msec
Changing the frequency . . . . Manual (one-step): Approx. 150 msec
Manual (fast): While the button is pressed.
Seek: Until a station is found, or the Up/Down key is pressed.

⑦ FF and REW

In the FF and REW mode, muting is done in to stages. Because the increase in tape speed increases the output signal from the head, a muting circuit of one stage is not enough. Without an additional muting circuit, a scrambled sound is reproduced.


FF or REW
FF/REW switch ON
Q301, Q302 ON
Charge C704 through D705.
First muting stage is activated.
Q701 ON
Q702 OFF
When the FF/REW switch is turned off, muting is deactivated.
Q451, Q452 ON
Second muting stage is activated.
Same operation as cassette loading (item 2)

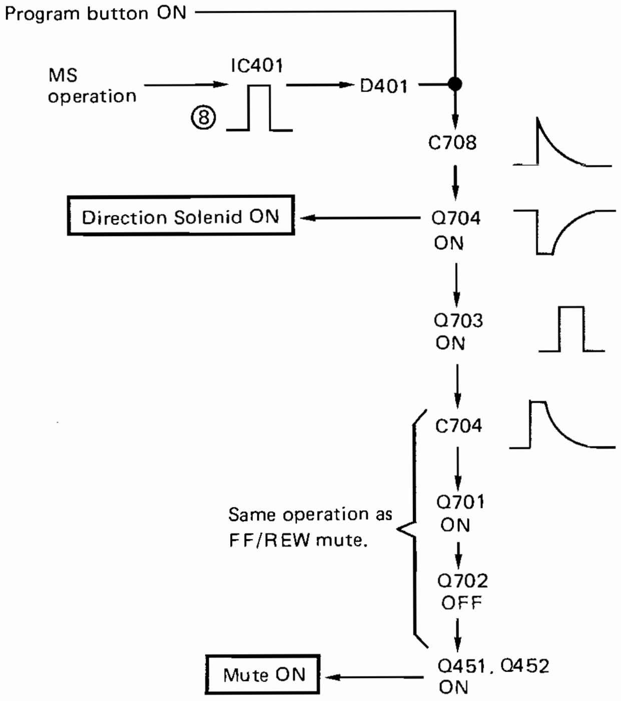
The second muting stage

↓

Muting is on even after the FF/REW switch is released; it is deactivated when C704 completely discharges. (This delay is provided to allow time for the cassette mechanism to stabilize after the transition.)

⑧ Program button

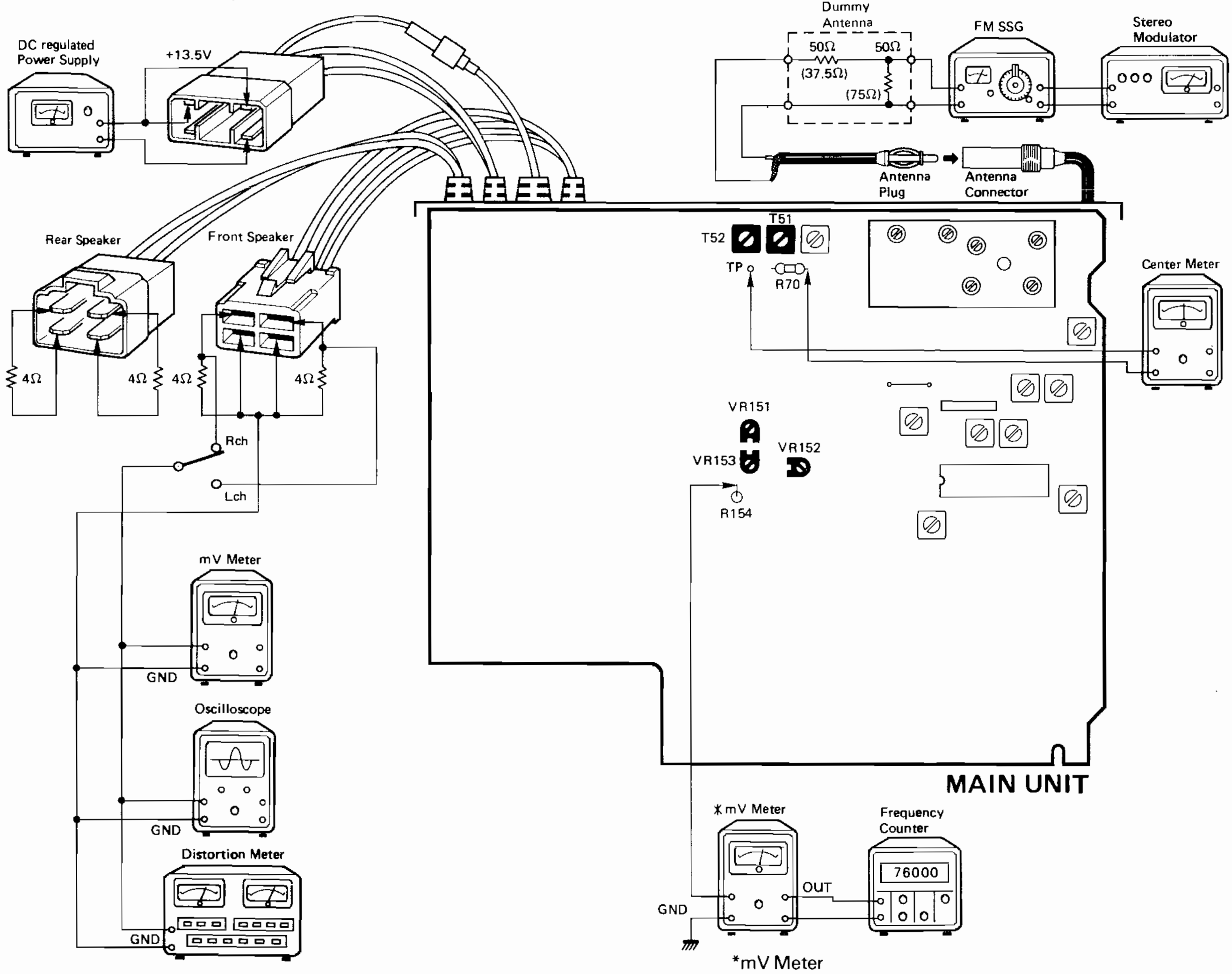
When the program button is pressed to change the tape direction, or to stop FF or REW and return to the Play mode, muting is performed until the tape drive is stabilized. (The same holds true in the FF or REW operation in the music search mode.)


Program button ON
MS operation
IC401
⑧
D401
C708
Direction Solenid ON
Q704 ON
Q703 ON
C704
Q701 ON
Q702 OFF
Q451, Q452 ON
Mute ON
Same operation as FF/REW mute.

4. ADJUSTMENT

4.1 FM IF ADJUSTMENT

- **Connection Diagram**


DC regulated Power Supply
+13.5V
Rear Speaker
Front Speaker
4Ω
4Ω
4Ω
4Ω
Rch
Lch
mV Meter
GND
Oscilloscope
GND
Distortion Meter
GND
Dummy Antenna
50Ω
50Ω
(37.5Ω)
(75Ω)
FM SSG
Stereo Modulator
Antenna Plug
Antenna Connector
T51
T52
TP
R70
Center Meter
VR151
VR152
VR153
R154
MAIN UNIT
✱mV Meter
Frequency Counter
76000
OUT
GND

*mV Meter
Input Impedance . . . . . more than 1 MΩ
Input Capacity . . . . less than 100 pF

Fig. 25

- **To Adjust**

1. Set the MONO switch to MONO.
2. Apply a signal of 98.0MHz, 400Hz 100% modulation and 60dB (μV) from the FM SSG and tune 98.0MHz.
3. Adjust T51 to make the center meter show 0.
4. Adjust T52 for minimum distortion.

4.2 FM MPX ADJUSTMENT

- **Connection Diagram (Shown in Fig. 25)**
- **To Adjust**

1. Set the MONO switch to AUTO.
2. Obtain non-modulation signal by setting SSG output at 60 dB (μV) 98.0MHz. Adjust VR153 so that the frequency counter indicates 76kHz ± 120Hz.
3. Adjust VR151 to reduce the oscilloscope wave to the minimum using only the modulation for the pilot signal (10%) and 60 dB (μV).

4.3 AUTO LEVEL ADJUSTMENT

- **Connection Diagram (Shown in Fig. 25)**
- **To Adjust**

1. Set the MONO switch to AUTO.
2. Set SSG at 98.0MHz and tune using the tuning button.
3. Set SSG to an output level of 35 dB (μV), and adjust VR152 to a separation of 5 dB (between the right and left channels).

4.4 FM TRACKING ADJUSTMENT

• Connection Diagram

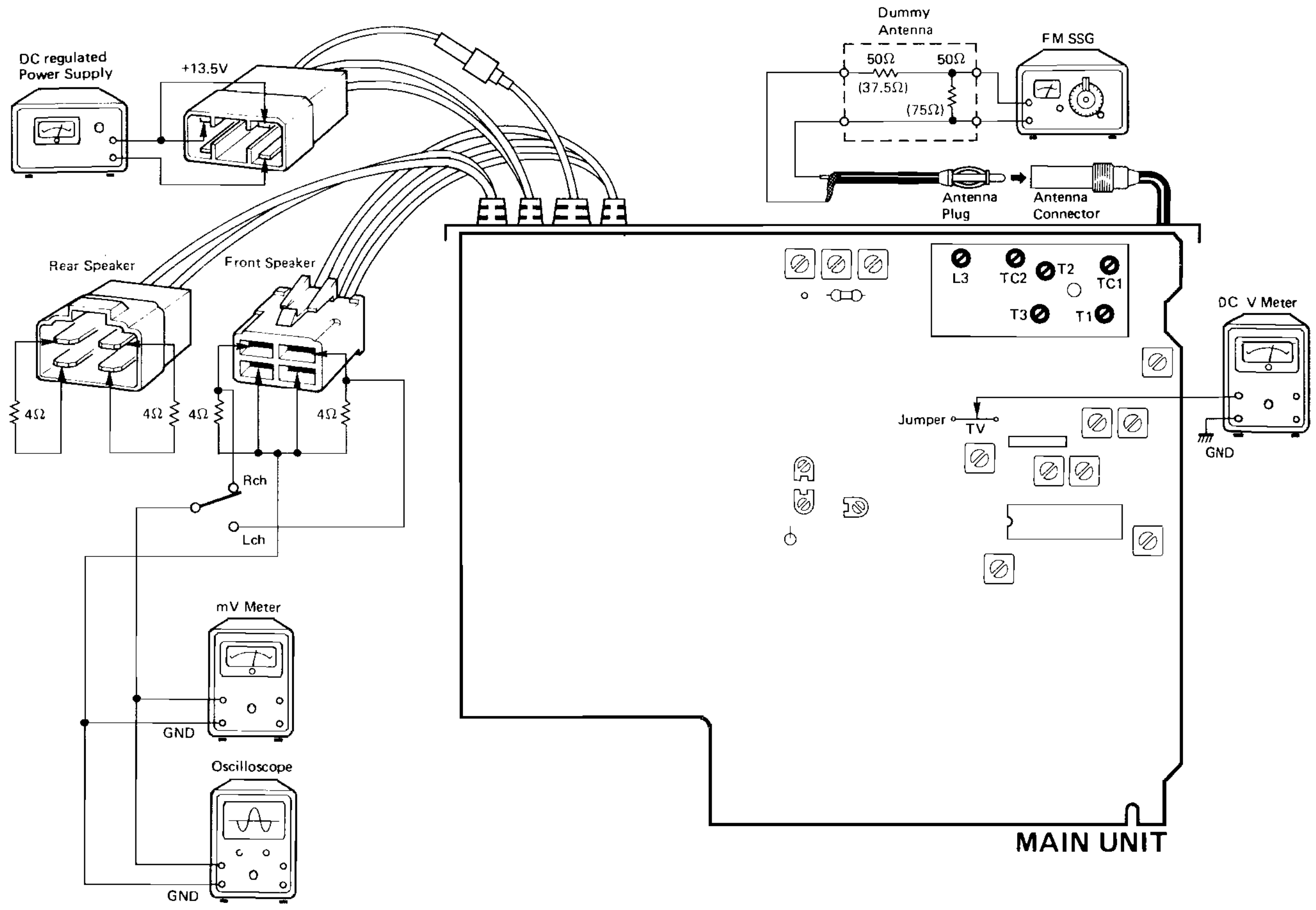

DC regulated Power Supply
+13.5V
Rear Speaker
Front Speaker
4Ω
4Ω
4Ω
4Ω
Rch
Lch
mV Meter
GND
Oscilloscope
GND
Dummy Antenna
50Ω
50Ω
(37.5Ω)
(75Ω)
FM SSG
Antenna Plug
Antenna Connector
L3
TC2
T2
TC1
T3
T1
DC V Meter
GND
Jumper
TV
MAIN UNIT

Fig. 26

• To Adjust

Set the MONO switch to AUTO

Frequency of FM SSG	Displayed Frequency	Adjusting Point	DC V Meter	mV Meter
1.	108.0 MHz	L3	7±0.2V	
2.	87.5 MHz	For Confirmation Only	More than 1.5V	
3. 90.0 MHz (400 Hz, 100% modulation) output level 10 dB (μV)	90.0 MHz	T1, T2		Maximum output
4. 104.0 MHz (400 Hz, 100% modulation) output level 10 dB (μV)	104.0 MHz	TC1, TC2		Maximum output
5. Repeat items (3) and (4) alternately so that the mV meter indicates maximum output.				
6. 98.0 MHz (400 Hz, 100% modulation) output level 8 dB (μV)	98.0 MHz	T3		Maximum output

4.5 AM IF ADJUSTMENT

• Connection Diagram

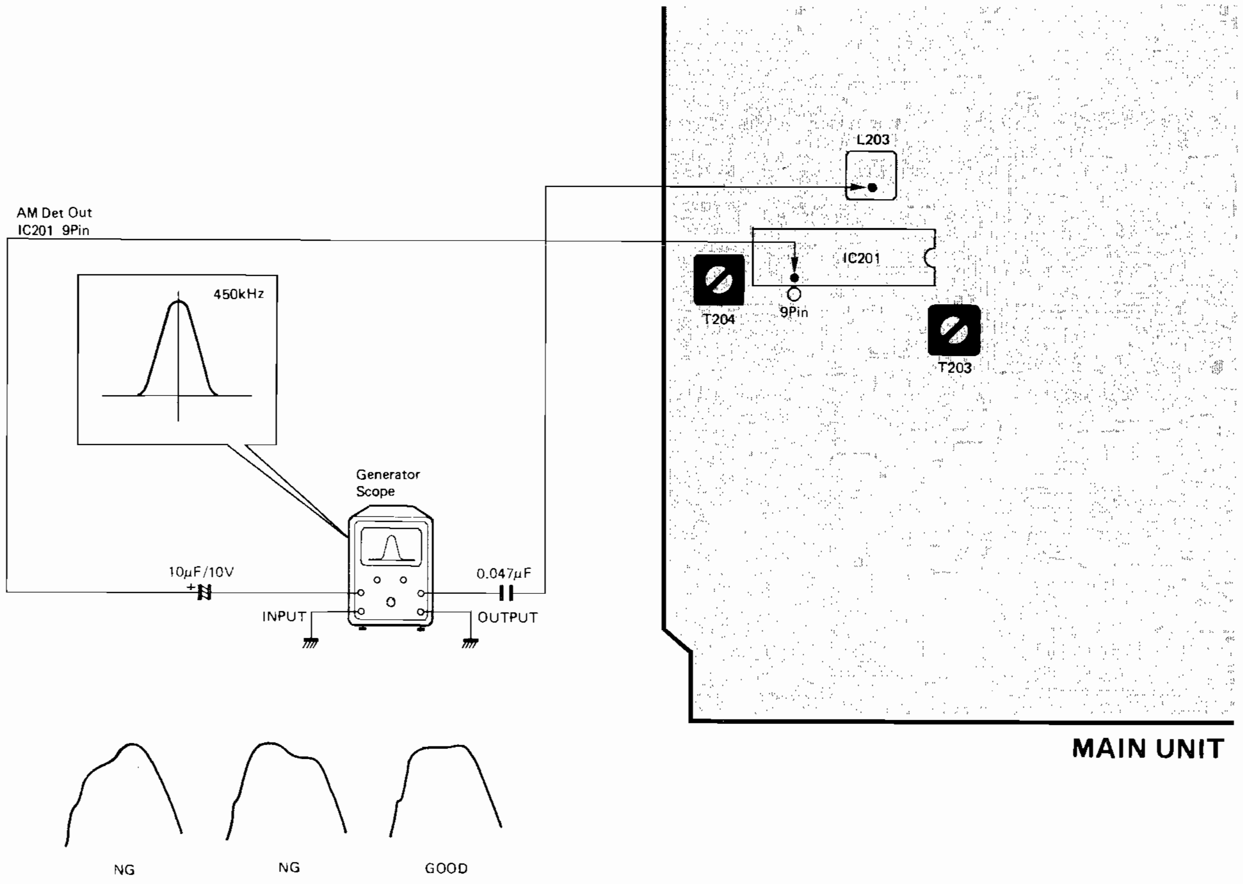

AM Det Out
IC201 9Pin
450kHz
Generator
Scope
10μF/10V
0.047μF
INPUT
OUTPUT
L203
IC201
T204
9Pin
T203
MAIN UNIT
NG
NG
GOOD

Fig. 27

• To Adjust

1. Set the input the generator scope to the range within which the U curve can be verified and move the cores of T203 and T204 until U curve is adjusted to its maximum amplitude and optimum symmetry.

4.6 AM TRACKING ADJUSTMENT

• Connection Diagram

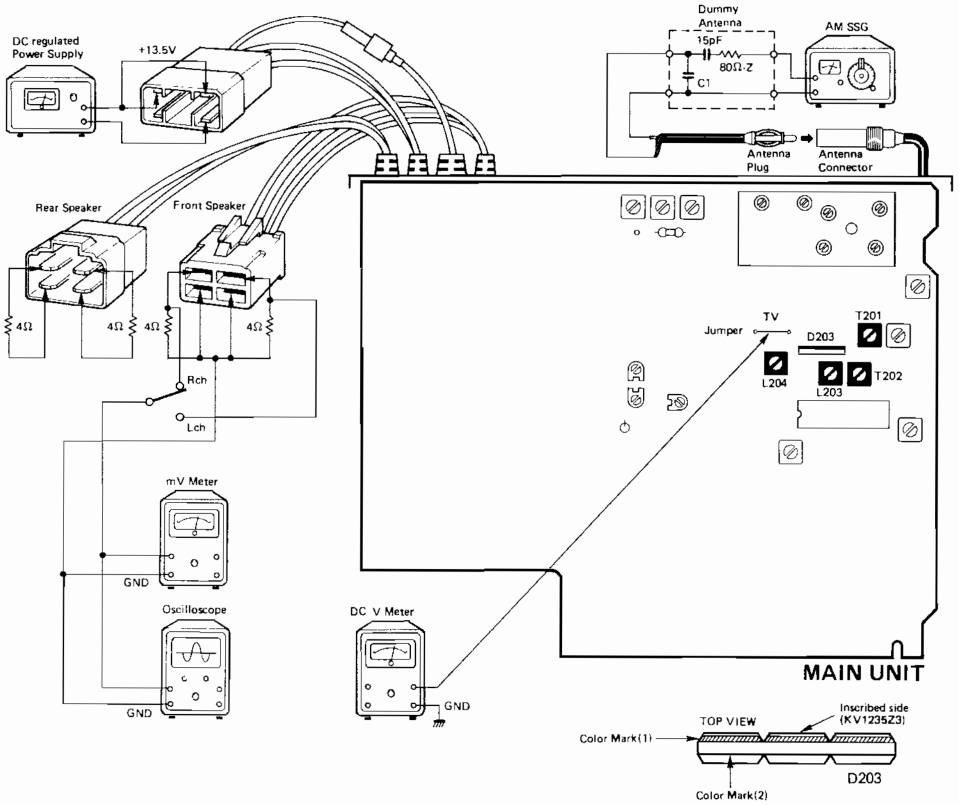

Dummy Antenna
15pF
80Ω-Z
C1
AM SSG
DC regulated Power Supply
+13.5V
Antenna Plug
Antenna Connector
Rear Speaker
Front Speaker
4Ω
4Ω
4Ω
4Ω
Rch
Lch
mV Meter
GND
Oscilloscope
GND
DC V Meter
GND
TV
Jumper
T201
D203
L204
T202
L203
MAIN UNIT
TOP VIEW
Inscribed side (KV1235Z3)
Color Mark(1)
D203
Color Mark(2)

Fig. 28

NOTICE:

Select C1 so that total capacity of 80pF is attained from the direction of the receive jack.

Z: Output impedance of SSG.

When D203 is replaced, use a variable capacitance diode of the same color markings (that is, same rank)

Rank	Color mark (1)	Color mark (2)
1	White	Blue
2	White	Red
3	White	No mark
4	White	White
5	White	Green

• To Adjust

When adjusting the 522kHz tuning voltage note that the tuning voltage differs according to the D203 (KV1235Z3) color mark.

Frequency of AM SSG	Displayed Frequency	Adjusting Point	D203 Rank	D203 Color	Tuning Voltage DC V Meter	mV Meter
1.	522 kHz	L204	1	Blue	0.9±0.1V	
			2	Red	1.0±0.1V	
			3	No mark	1.1±0.1V	
			4	White	1.2±0.1V	
			5	Green	1.3±0.1V	
2.	1,629kHz	For Confirmation Only	Less than 7.2V			
3. 603 kHz (400 Hz, 30% modulation) output 20 dB (μV)	603 kHz	T201, T202				Maximum output
4. 1,800 kHz (400 Hz, 30% modulation) output 100 dB (μV)	900 kHz	L203				Minimum output

4.7 DOLBY NR LEVEL ADJUSTMENT

• Connection Diagram

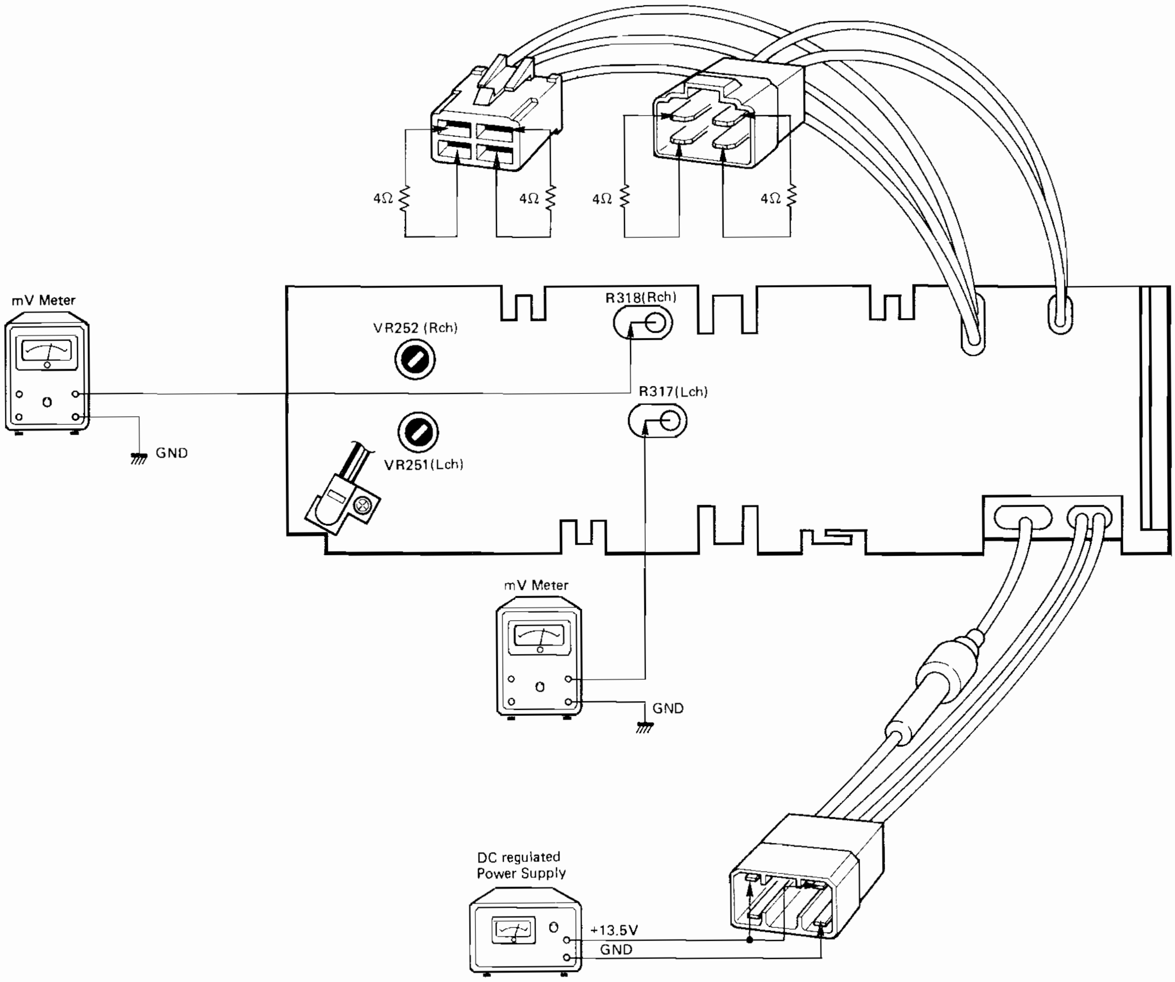

4Ω
4Ω
4Ω
4Ω
mV Meter
R318(Rch)
VR252 (Rch)
R317(Lch)
GND
VR251(Lch)
mV Meter
GND
DC regulated
Power Supply
+13.5V
GND

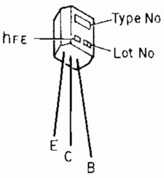
Fig. 29

• To Adjust

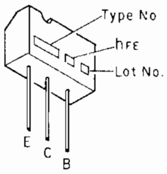
1. Playback the Dolby level calibration tape (400Hz, 200 nwb/m) and adjust VR251 (L ch), VR252 (R ch) so that the mV meter shows 300mV (−8.2 dBs) ±1 dBs both in forward and reverse directions.

• IC's and Transistors

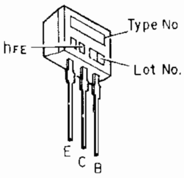
2SA1048
2SC2458
2SC3113


Type No
hFE
Lot No
E
C
B

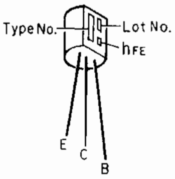
2SB822
2SD1055F


Type No
hFE
Lot No.
E
C
B

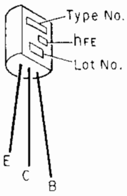
2SC2786
2SC2787


Type No
hFE
Lot No.
E
C
B

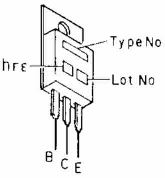
2SC1815


Type No.
Lot No.
hFE
E
C
B

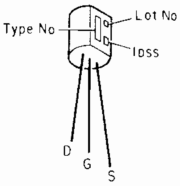
2SD655


Type No.
hFE
Lot No.
E
C
B

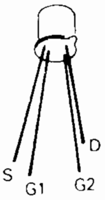
2SD1276


Type No
hFE
Lot No
B
C
E

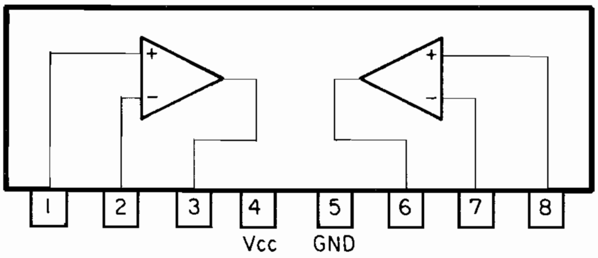
2SK163


Lot No
Type No
IDSS
D
G
S

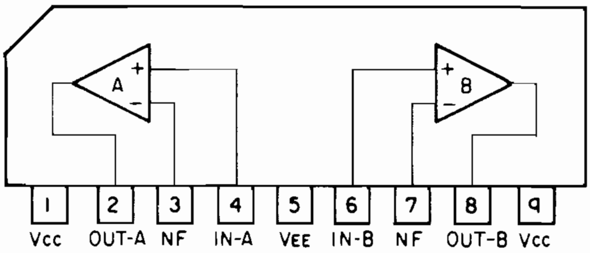
P001



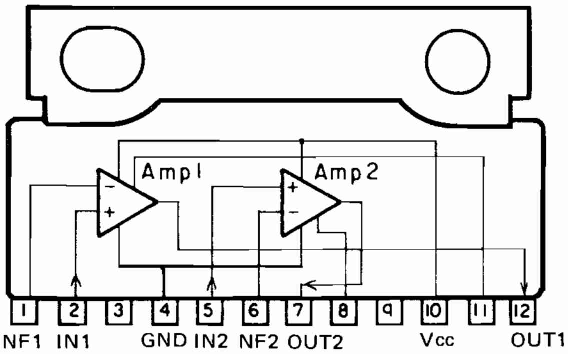
MB3106M


+
−
+
−
1
2
3
4
5
6
7
8
Vcc
GND

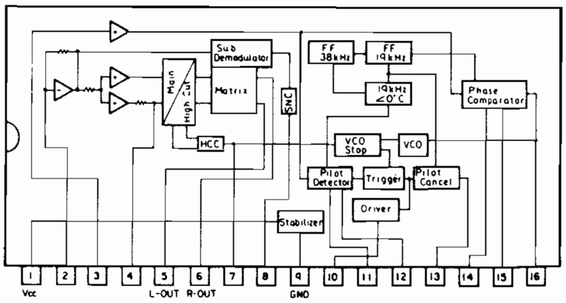
TA75558S


A
B
1
2
3
4
5
6
7
8
9
Vcc
OUT-A
NF
IN-A
VEE
IN-B
NF
OUT-B
Vcc

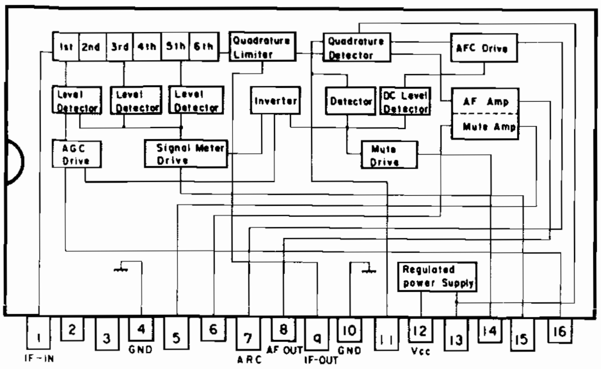
HA1398


Amp1
Amp2
1
2
3
4
5
6
7
8
9
10
11
12
NF1
IN1
GND
IN2
NF2
OUT2
Vcc
OUT1

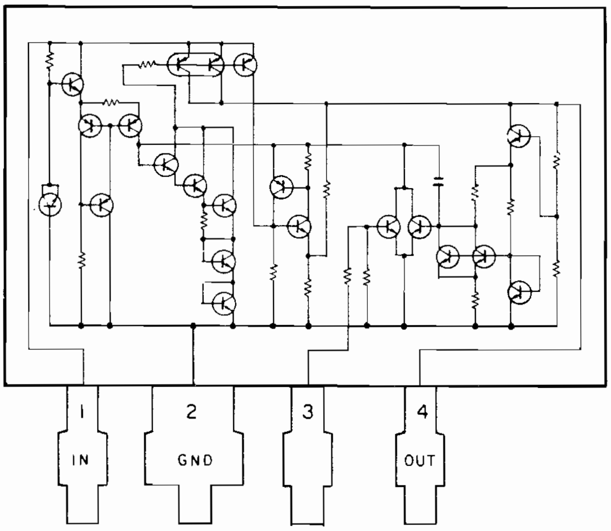
LA3376P


Sub Demodulator
Main
High Cut
Matrix
SNC
HCC
FF 38kHz
FF 19kHz
19kHz ∠0°C
Phase Comparator
VCO Stop
VCO
Pilot Detector
Trigger
Pilot Cancel
Driver
Stabilizer
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Vcc
L-OUT
R-OUT
GND

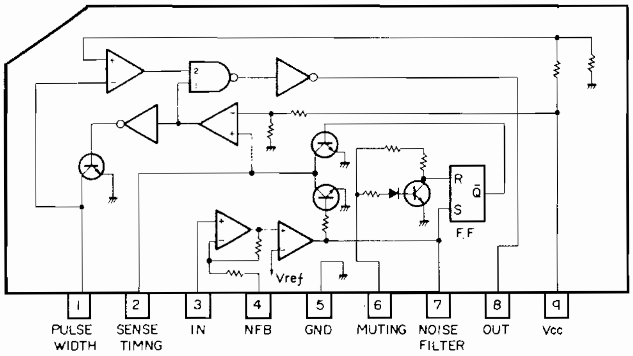
LA1140B


1st
2nd
3rd
4th
5th
6th
Quadrature Limiter
Quadrature Detector
AFC Drive
Level Detector
Level Detector
Level Detector
Inverter
Detector
DC Level Detector
AF Amp
Mute Amp
AGC Drive
Signal Meter Drive
Mute Drive
Regulated power Supply
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
IF-IN
GND
ARC
AF OUT
IF-OUT
GND
Vcc

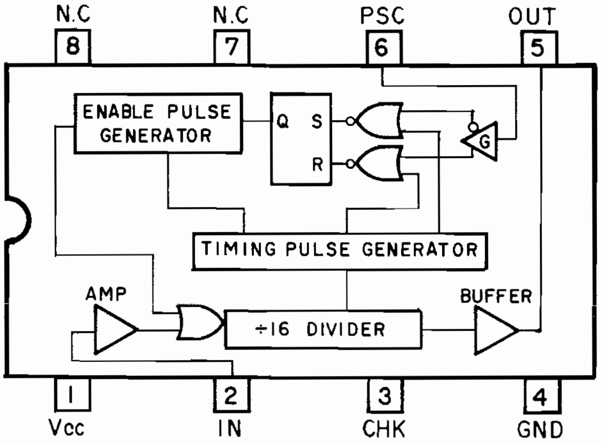
AN6540


1
2
3
4
IN
GND
OUT

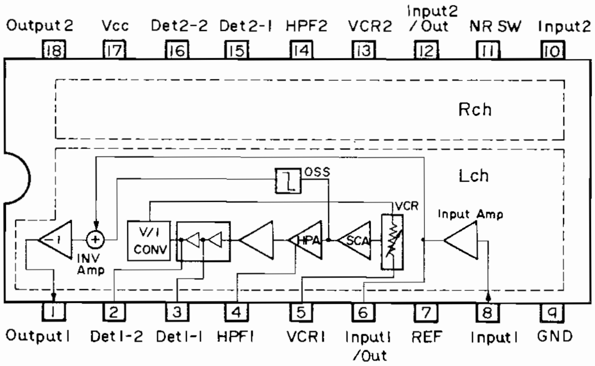
PA0011


R
Q̄
S
F.F
Vref
1
2
3
4
5
6
7
8
9
PULSE WIDTH
SENSE TIMNG
IN
NFB
GND
MUTING
NOISE FILTER
OUT
Vcc

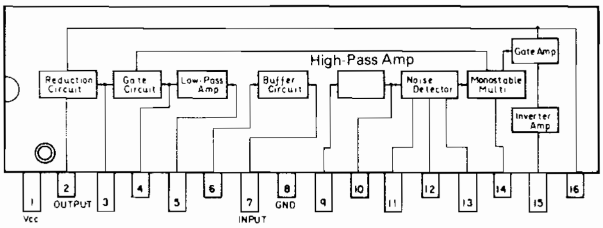
μPB553AC


N.C
N.C
PSC
OUT
8
7
6
5
ENABLE PULSE GENERATOR
Q
S
R
G
TIMING PULSE GENERATOR
AMP
BUFFER
÷16 DIVIDER
1
2
3
4
Vcc
IN
CHK
GND

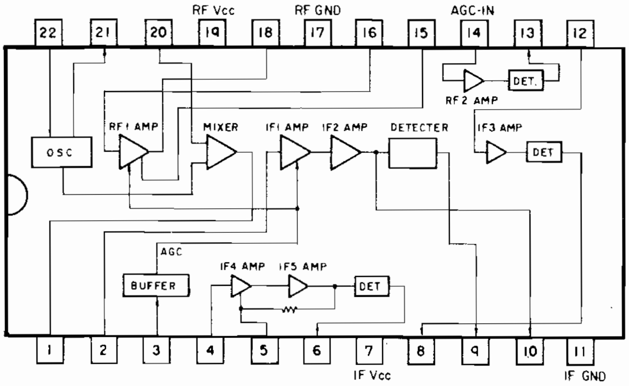
HA12047


Output 2
Vcc
Det2-2
Det2-1
HPF2
VCR2
Input2 / Out
NR SW
Input2
18
17
16
15
14
13
12
11
10
Rch
Lch
OSS
VCR
Input Amp
-1
INV Amp
V/I CONV
HPA
SCA
1
2
3
4
5
6
7
8
9
Output1
Det1-2
Det1-1
HPF1
VCR1
Input1 /Out
REF
Input1
GND

LA2110

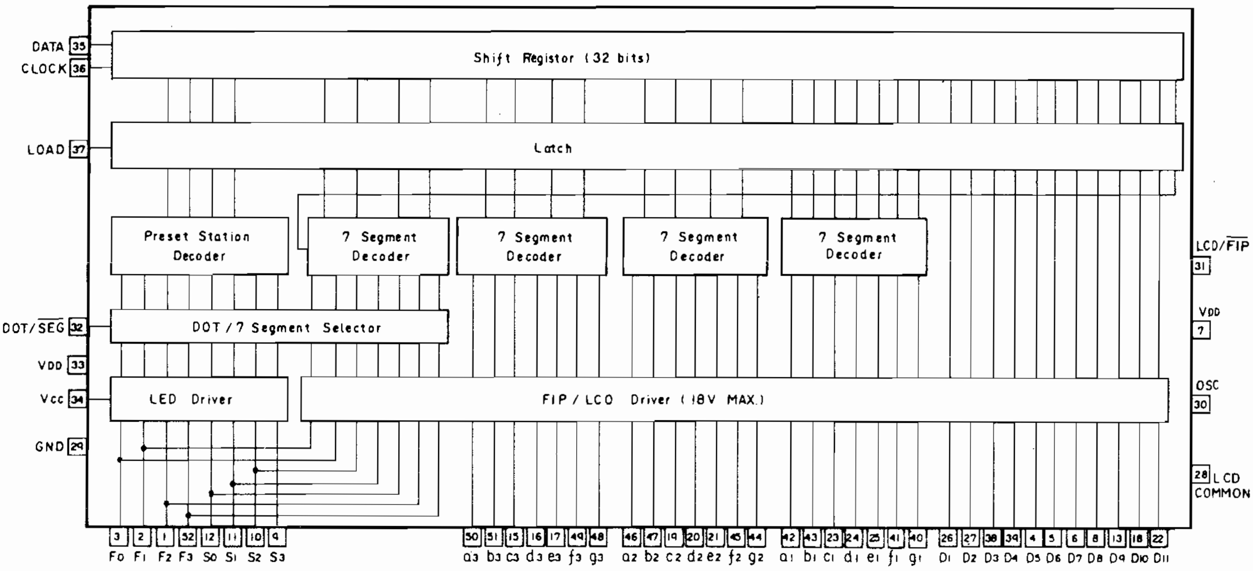

High-Pass Amp
Gate Amp
Reduction Circuit
Gate Circuit
Low-Pass Amp
Buffer Circuit
Noise Detector
Monostable Multi
Inverter Amp
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Vcc
OUTPUT
INPUT
GND

PA3016


RF Vcc
RF GND
AGC-IN
22
21
20
19
18
17
16
15
14
13
12
DET.
RF 2 AMP
OSC
RF1 AMP
MIXER
IF1 AMP
IF2 AMP
DETECTER
IF3 AMP
DET
AGC
BUFFER
IF4 AMP
IF5 AMP
DET
1
2
3
4
5
6
7
8
9
10
11
IF Vcc
IF GND

*IC's marked by * are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

* µPD6320G

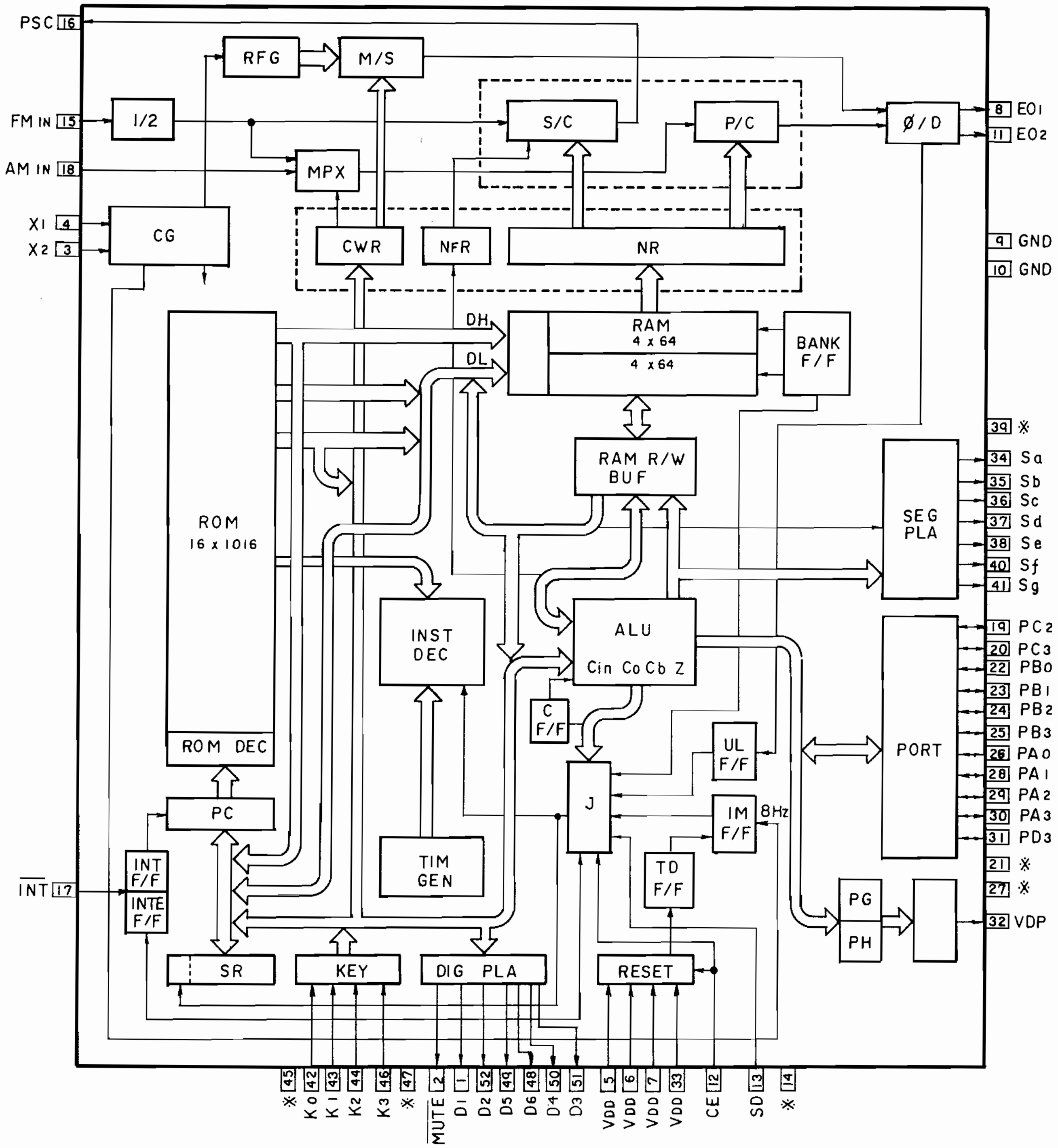

DATA 35
CLOCK 36
Shift Register (32 bits)
LOAD 37
Latch
Preset Station Decoder
7 Segment Decoder
7 Segment Decoder
7 Segment Decoder
7 Segment Decoder
LCD/FIP 31
VDD 7
DOT/SEG 32
DOT / 7 Segment Selector
VDD 33
Vcc 34
LED Driver
FIP / LCD Driver (18V MAX.)
OSC 30
GND 29
28 LCD COMMON
3 2 1 52 12 11 10 9
F0 F1 F2 F3 S0 S1 S2 S3
50 51 15 16 17 49 48
a3 b3 c3 d3 e3 f3 g3
46 47 19 20 21 45 44
a2 b2 c2 d2 e2 f2 g2
42 43 23 24 25 41 40
a1 b1 c1 d1 e1 f1 g1
26 27 38 39 4 5 6 8 13 18 22
D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11

µPD6320G
PIN FUNCTIONS

Pin No.	Pin Name	I/O	Functions and Operations
1	F2 (f4)	Output	Outputs signals for displaying 7-segment memory indicator
2	F1 (a4)	Output	Outputs signals for memory indicator
3	F0 (b4)	Output	
4	D5	Output	Outputs signal to LCD
5	D6	Output	Outputs "ST" display signal to LCD
6	D7	Output	Outputs signal to LCD
7	VDD		Power supply terminal +5V (not used)
8	D8	Output	Outputs signal to LCD
9	S3	Output	Outputs signals for the memory indicator
10	S2 (c4)	Output	
11	S1 (d4)	Output	
12	S0 (e4)	Output	
13	D9	Output	Outputs "ME" display signal to LCD
14	NC		No connection
15	c3	Output	Outputs 7-segment signals
16	d3	Output	
17	e3	Output	
18	D10	Output	Outputs "." display signal to LCD
19	c2	Output	Outputs 7-segment signals
20	d2	Output	
21	e2	Output	
22	D11	Output	Outputs signal to LCD
23	c1	Output	Outputs 7-segment signals
24	d1	Output	
25	e1	Output	

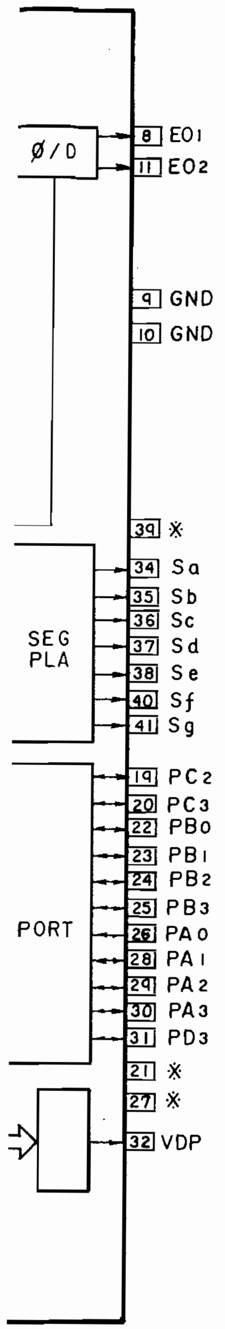
Pin No.	Pin Name	I/O	Functions and Operations
26	D1	Output	Outputs "AM2" display signal to LCD
27	D2	Output	Outputs "AM1" display signal to LCD
28	COMMON	Output	Outputs common signal to LCD
29	Vss		Ground
30	OSC		Terminal which determines the oscillation frequency of LCD
31	LCD/$\overline{\text{FIP}}$		Terminal switching between LCD/FIP. With "H" input signal, LCD. With "L" input signal, FIP.
32	DOT/$\overline{\text{SEG}}$		Terminal switching between LED display and 7-segment display. With "H" input signal, dot display. With "L" input signal, 7-segment display.
33	VDD		Power supply terminal +5V
34	VCC		Power supply terminal +5V
35	DATA	Input	Data input terminal for shift register
36	CLOCK	Input	Data input to shift register
37	LOAD	Input	With the rising edge from "L" to "H", the contents of the shift register are transferred to the latch circuit.
38	D3	Output	Outputs "FM" display signal to LCD
39	D4	Output	Outputs "1" display signal to LCD
40	g1	Output	Outputs 7-segment signals
41	f1	Output	
42	a1	Output	
43	b1	Output	
44	g2	Output	
45	f2	Output	
46	a2	Output	
47	b2	Output	
48	g3	Output	
49	f3	Output	
50	a3	Output	
51	b3	Output	
52	F3 (g4)		Outputs signal for the memory indicator

*PD4044


PSC 16
FM IN 15
AM IN 18
X1 4
X2 3
INT 17
RFG
M/S
1/2
S/C
P/C
Ø/D
MPX
CG
CWR
NFR
NR
RAM 4 x 64 4 x 64
DH
DL
BANK F/F
ROM 16 x 1016
ROM DEC
RAM R/W BUF
SEG PLA
INST DEC
ALU Cin Co Cb Z
C F/F
UL F/F
IM F/F
8Hz
J
PORT
PC
INT F/F
INTE F/F
TIM GEN
TD F/F
PG
PH
SR
KEY
DIG PLA
RESET
8 EO1
11 EO2
9 GND
10 GND
39 ※
34 Sa
35 Sb
36 Sc
37 Sd
38 Se
40 Sf
41 Sg
19 PC2
20 PC3
22 PB0
23 PB1
24 PB2
25 PB3
26 PA0
28 PA1
29 PA2
30 PA3
31 PD3
21 ※
27 ※
32 VDP
45 ※
42 K0
43 K1
44 K2
46 K3
47 ※
2 MUTE
1 D1
52 D2
49 D5
48 D6
50 D4
51 D3
5 VDD
6 VDD
7 VDD
33 VDD
12 CE
13 SD
14 ※

PD4044
PIN FUNCTIONS

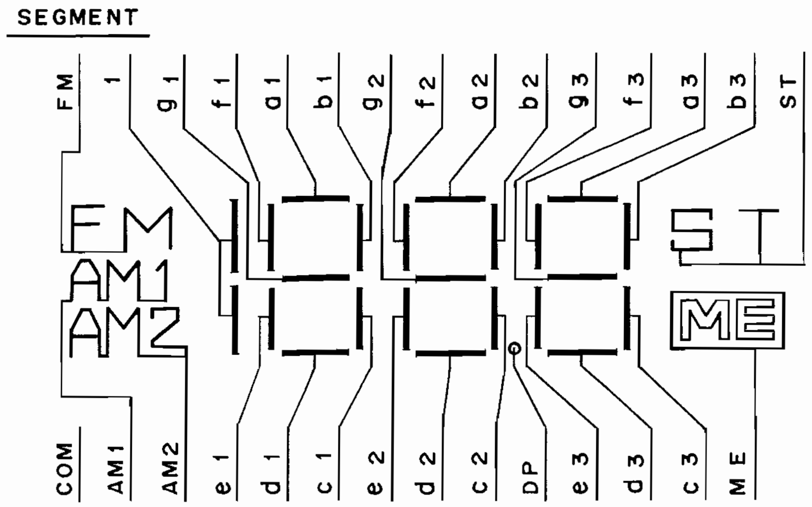
Pin No.	Pin Name	I/O	Functions and Operations
1	D1	Output	Outputs sensing signals for initial setting matrix
2	$\overline{\text{MUTE}}$	Output	Outputs muting signal. Active low
3	X2		Crystal oscillator connection terminal. 4.5 MHz
4	X1		Crystal oscillator connection terminal.
5	VDD		Power supply terminal +5V, CPU & ports
6	VDD		Power supply terminal +5V, X'tal & PLL section
7	VDD		Power supply terminal +5V, detector section
8	EO1	Output	PLL error output. By externally connecting a loop filter, PLL is formed.
9	VSS		Ground terminal, CPU & ports
10	VSS		Ground terminal, detector section
11	EO2	Output	PLL error output. By externally connecting a loop filter, PLL is formed.
12	CE	Input	Chip enable input. With "H" input signal, normal operation. With "L" input signal, backup.
13	SD	Input	Stop signal input terminal for auto search. With "H" input signal, auto search stops.
14	NC		
15	FM IN	Input	Counter input from prescaler. Input is AC-coupled by a capacitor.
16	PSC	Output	Controls output for prescaler
17	$\overline{\text{STEREO}}$	Input	Input for LCD indicator. Active low.
18	AM IN	Input	VCO inputo for AM.
19	$\overline{\text{LOC ATT}}$	Output	NC
20	$\overline{\text{AGC CUT}}$	Output	Output "L" signal when sweep mode
21	NC		
22 ∫ 25	PB0 ∫ PB3	Output	NC
26	AM	Output	Outputs band select signal
27	NC		
28	FREE	Output	
29	FM	Output	
30	ME	Output	Outputs "H" signal during memory enable
31	$\overline{\text{TAPE}}$	Input	Tape mode input. Active low
32	KEY-ACK	Output	Outputs "H" signal when the key depression is accepted
33	VDD		Power supply terminal +5V. Internally connected with pin 7.
34	Sa	Output	Outputs sensing signal for momentary key matrixing
35	Sb	Output	
36	Sc	Output	
37	Sd	Output	
38	Se	Output	
39	NC		
40	Sf (DATA)	Output	Outputs data to the display driver
41	Sg	Output	Outputs sensing signal for momentary key matrixing
42	K0	Input	Inputs sensing signal for mementary key matrixing & initial setting matrixing.
43	K1	Input	
44	K2	Input	
45	NC		
46	K3	Input	Inputs sensing signal for momentary key matrixing & initial setting matrixing
47	NC		
48	D6 (LOAD)	Output	Load for the display driver, clock output
49	D5 (CLOCK)	Output	
50	—		
51	D3	Output	NC
52	D2	Output	Outputs sensing signal for initial setting matrixing


Ø / D
8 EO1
11 EO2
9 GND
10 GND
39 ※
34 Sa
35 Sb
36 Sc
37 Sd
38 Se
40 Sf
41 Sg
SEG PLA
19 PC2
20 PC3
22 PB0
23 PB1
24 PB2
25 PB3
26 PA0
28 PA1
29 PA2
30 PA3
31 PD3
PORT
21 ※
27 ※
32 VDP

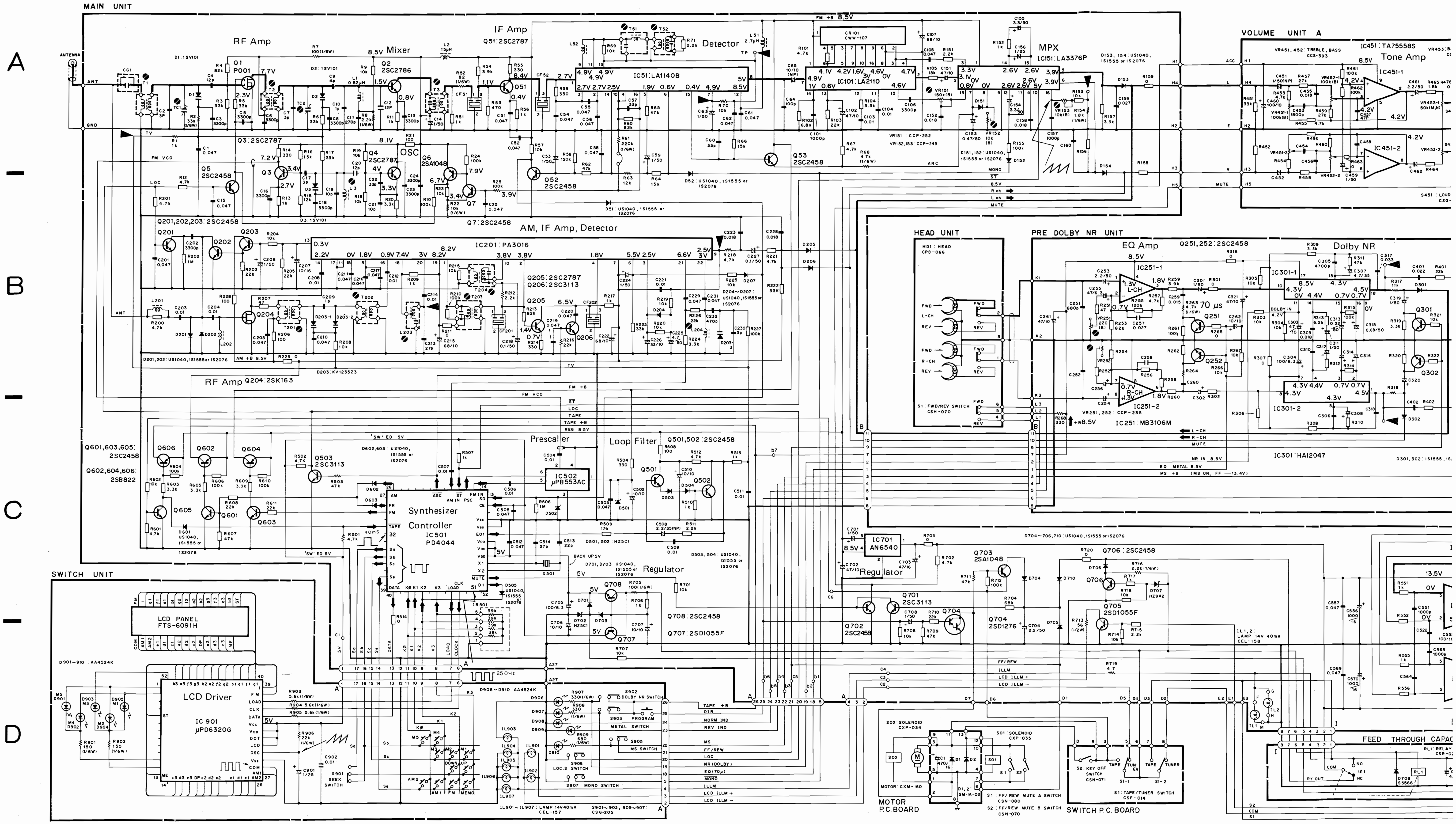
PD4044
PIN FUNCTIONS

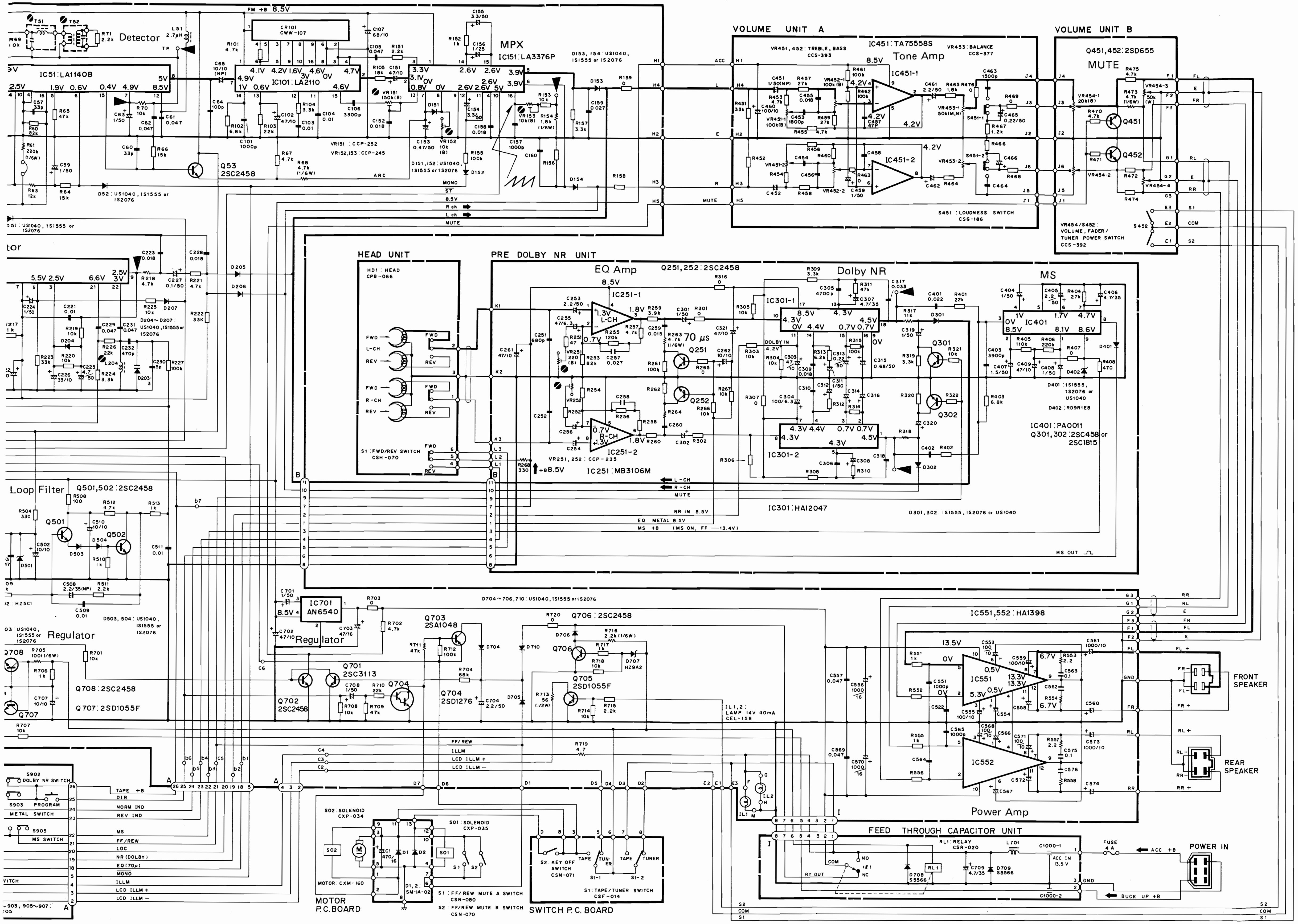
Pin No.	Pin Name	I/O	Functions and Operations
1	D1	Output	Outputs sensing signals for initial setting matrix
2	$\overline{\text{MUTE}}$	Output	Outputs muting signal. Active low
3	X2		Crystal oscillator connection terminal. 4.5 MHz
4	X1		Crystal oscillator connection terminal.
5	VDD		Power supply terminal +5V, CPU & ports
6	VDD		Power supply terminal +5V, X'tal & PLL section
7	VDD		Power supply terminal +5V, detector section
8	EO1	Output	PLL error output. By externally connecting a loop filter, PLL is formed.
9	VSS		Ground terminal, CPU & ports
10	VSS		Ground terminal, detector section
11	EO2	Output	PLL error output. By externally connecting a loop filter, PLL is formed.
12	CE	Input	Chip enable input. With "H" input signal, normal operation. With "L" input signal, backup.
13	SD	Input	Stop signal input terminal for auto search. With "H" input signal, auto search stops.
14	NC		
15	FM IN	Input	Counter input from prescaler. Input is AC-coupled by a capacitor.
16	PSC	Output	Controls output for prescaler
17	$\overline{\text{STEREO}}$	Input	Input for LCD indicator. Active low.
18	AM IN	Input	VCO inputo for AM.
19	$\overline{\text{LOC ATT}}$	Output	NC
20	$\overline{\text{AGC CUT}}$	Output	Output "L" signal when sweep mode
21	NC		
22 ~ 25	PB0 ~ PB3	Output	NC
26	AM	Output	Outputs band select signal
27	NC		
28	FREE	Output	
29	FM	Output	
30	ME	Output	Outputs "H" signal during memory enable
31	$\overline{\text{TAPE}}$	Input	Tape mode input. Active low
32	KEY-ACK	Output	Outputs "H" signal when the key depression is accepted
33	VDD		Power supply terminal +5V. Internally connected with pin 7.
34	Sa	Output	Outputs sensing signal for momentary key matrixing
35	Sb	Output	
36	Sc	Output	
37	Sd	Output	
38	Se	Output	
39	NC		
40	Sf (DATA)	Output	Outputs data to the display driver
41	Sg	Output	Outputs sensing signal for momentary key matrixing
42	K0	Input	Inputs sensing signal for mementary key matrixing & initial setting matrixing.
43	K1	Input	
44	K2	Input	
45	NC		
46	K3	Input	Inputs sensing signal for momentary key matrixing & initial setting matrixing
47	NC		
48	D6 (LOAD)	Output	Load for the display driver, clock output
49	D5 (CLOCK)	Output	
50	—		
51	D3	Output	NC
52	D2	Output	Outputs sensing signal for initial setting matrixing

LCD PANEL: FTS-6091H


SEGMENT
FM
1
g1
f1
a1
b1
g2
f2
a2
b2
g3
f3
a3
b3
ST
FM
AM1
AM2
ST
ME
COM
AM1
AM2
e1
d1
c1
e2
d2
c2
DP
e3
d3
c3
ME

5. SCHEMATIC CIRCUIT DIAGRAM


A
B
C
D
MAIN UNIT
ANTENNA
ANT
GND
RF Amp
Q1 P001
Mixer
Q2 2SC2786
IF Amp
Q51 2SC2787
Detector
MPX
IC151 LA3376P
IC51 LA1140B
IC101 LA2110
Q3 2SC2787
OSC
Q4 2SC2787
Q6 2SA1048
Q5 2SC2458
Q7 2SC2458
Q52 2SC2458
Q53 2SC2458
D1 1SV101
D2 1SV101
D3 1SV101
CR101 CWW-107
VR151 CCP-252
VR152,153 CCP-245
D151,152 US1040, 1S1555 or 1S2076
D153,154 US1040, 1S1555 or 1S2076
D52 US1040, 1S1555 or 1S2076
D51 US1040, 1S1555 or 1S2076
FM +B 8.5V
AM, IF Amp, Detector
IC201 PA3016
Q201,202,203 2SC2458
Q205 2SC2787
Q206 2SC3113
RF Amp Q204 2SK163
D201,202 US1040, 1S1555 or 1S2076
D203 KV1235Z3
D204~D207 US1040, 1S1555 or 1S2076
VOLUME UNIT A
IC451 TA75558S
Tone Amp
IC451-1
IC451-2
VR451,452 TREBLE, BASS CCS-393
S451 LOUDNESS
HEAD UNIT
MD1 HEAD CPB-066
S1 FWD/REV SWITCH CSH-070
PRE DOLBY NR UNIT
EQ Amp
IC251-1
IC251-2
IC251 MB3106M
Q251,252 2SC2458
VR251,252 CCP-235
70 μs
Dolby NR
IC301-1
IC301-2
IC301 HA12047
D301,302 1S1555, 1S2076
Q301
Q302
Q601,603,605 2SC2458
Q602,604,606 2SB822
Q606
Q602
Q604
Q605
Q601
Q603
D601 US1040, 1S1555 or 1S2076
Q503 2SC3113
D602,603 US1040, 1S1555 or 1S2076
Prescaler
IC502 μPB553AC
Loop Filter
Q501,502 2SC2458
Synthesizer Controller
IC501 PD4044
D501,502 HZ5C1
D503,504 US1040, 1S1555 or 1S2076
D505 US1040, 1S1555 or 1S2076
Regulator
Q708 2SC2458
Q707 2SD1055F
D701,D703 US1040, 1S1555 or 1S2076
D702 HZ5C1
IC701 AN6540
Regulator
Q703 2SA1048
Q701 2SC3113
Q702 2SC2458
Q704 2SD1276
Q706 2SC2458
Q705 2SD1055F
D704~706,710 US1040, 1S1555 or 1S2076
D707 HZ9A2
IL1,2 LAMP 14V 40mA CEL-158
SWITCH UNIT
LCD PANEL FTS-6091H
LCD Driver
IC901 μPD6320G
D901~910 AA4524K
D906~D910 AA4524K
S901 SEEK SWITCH
S902 DOLBY NR SWITCH
S903 PROGRAM
METAL SWITCH
S905 MS SWITCH
S906 LOC.S SWITCH
S907 MONO SWITCH
IL901~IL907 LAMP 14V40mA CEL-157
S901~903,905~907 CSG-205
250Hz
40mS
TAPE +B
DIR
NORM IND
REV IND
MS
FF/REW
LOC
NR (DOLBY)
EQ (70μ)
MONO
ILLM
LCD ILLM +
LCD ILLM −
S02 SOLENOID CXP-034
S01 SOLENOID CXP-035
MOTOR CXM-160
D1,2 SM-1A-02
S1 FF/REW MUTE A SWITCH
S2 FF/REW MUTE B SWITCH CSN-070
MOTOR P.C.BOARD
S2 KEY OFF SWITCH CSN-071
S1 TAPE/TUNER SWITCH CSF-014
SWITCH P.C.BOARD
FEED THROUGH CAPACITOR
RL1 RELAY


4
5
6
7
8
9
A
B
C
D
Detector
IC51 : LA1140B
FM +B 8.5V
CR101 CWW-107
IC101 : LA2110
MPX
IC151 : LA3376P
Q53 2SC2458
VOLUME UNIT A
IC451 : TA75558S
Tone Amp
IC451-1
IC451-2
S451 : LOUDNESS SWITCH CSG-186
VOLUME UNIT B
Q451, 452 : 2SD655
MUTE
Q451
Q452
VR454/S452 : VOLUME, FADER/TUNER POWER SWITCH CCS-392
HEAD UNIT
HD1 : HEAD CPB-066
S1 : FWD/REV SWITCH CSH-070
PRE DOLBY NR UNIT
EQ Amp
Q251, 252 : 2SC2458
IC251-1
IC251-2
IC251 : MB3106M
70 μs
Q251
Q252
Dolby NR
IC301-1
IC301-2
IC301 : HA12047
Q301
Q302
D301, 302 : 1S1555, 1S2076 or US1040
MS
IC401
IC401 : PA0011
Q301, 302 : 2SC458 or 2SC1815
D401 : 1S1555, 1S2076 or US1040
D402 : RD9R1EB
MS OUT
Loop Filter
Q501, 502 : 2SC2458
Q501
Q502
Regulator
IC701 AN6540
Q703 2SA1048
Q706 : 2SC2458
Q701 2SC3113
Q702 2SC2458
Q704 2SD1276
Q705 2SD1055F
Q708 : 2SC2458
Q707 : 2SD1055F
D704~706, 710 : US1040, 1S1555 or 1S2076
IL1, 2 : LAMP 14V 40mA CEL-158
IC551, 552 : HA1398
IC551
IC552
Power Amp
FRONT SPEAKER
REAR SPEAKER
FEED THROUGH CAPACITOR UNIT
RL1 : RELAY CSR-020
FUSE 4A
ACC +B
BUCK UP +B
POWER IN
S902 DOLBY NR SWITCH
S903 PROGRAM METAL SWITCH
S905 MS SWITCH
S02 : SOLENOID CXP-034
S01 : SOLENOID CXP-035
MOTOR : CXM-160
MOTOR P.C. BOARD
S1 : FF/REW MUTE A SWITCH CSN-080
S2 : FF/REW MUTE B SWITCH CSN-070
S2 : KEY OFF SWITCH CSN-071
S1 : TAPE/TUNER SWITCH CSF-014
SWITCH P.C. BOARD

SWITCHES

◎ SWITCH UNIT

S901 : SEEK SWITCH .... MANUAL–SEEK
S902 : DOLBY NR SWITCH .... ON–OFF
S903 : METAL SWITCH .... 70 μs – 120 μs
S905 : MS SWITCH .... ON–OFF
S906 : LOC. S SWITCH ....LOCAL– DX
S907 . MONO SWITCH .... MONO–AUTO

◎ VOLUME UNIT A, VOLUME UNIT B

S451 : LOUDNESS SWITCH .... ON–OFF
S452 : TUNER POWER SWITCH .... ON–OFF

◎ HEAD UNIT

S1 : FWD/REV SWITCH .... FWD–REV

◎ SWITCH P. C. BOARD

S1 : TAPE/TUNER SWITCH .... TAPE–TUNER
S2 : KEY OFF SWITCH .... ON–OFF

◎ MISCELLANEOUS

S1 : FF/REW MUTE A SWITCH .... ON–OFF
S2 : FF/REW MUTE B SWITCH .... ON–OFF

The underlined indicates the switch position.

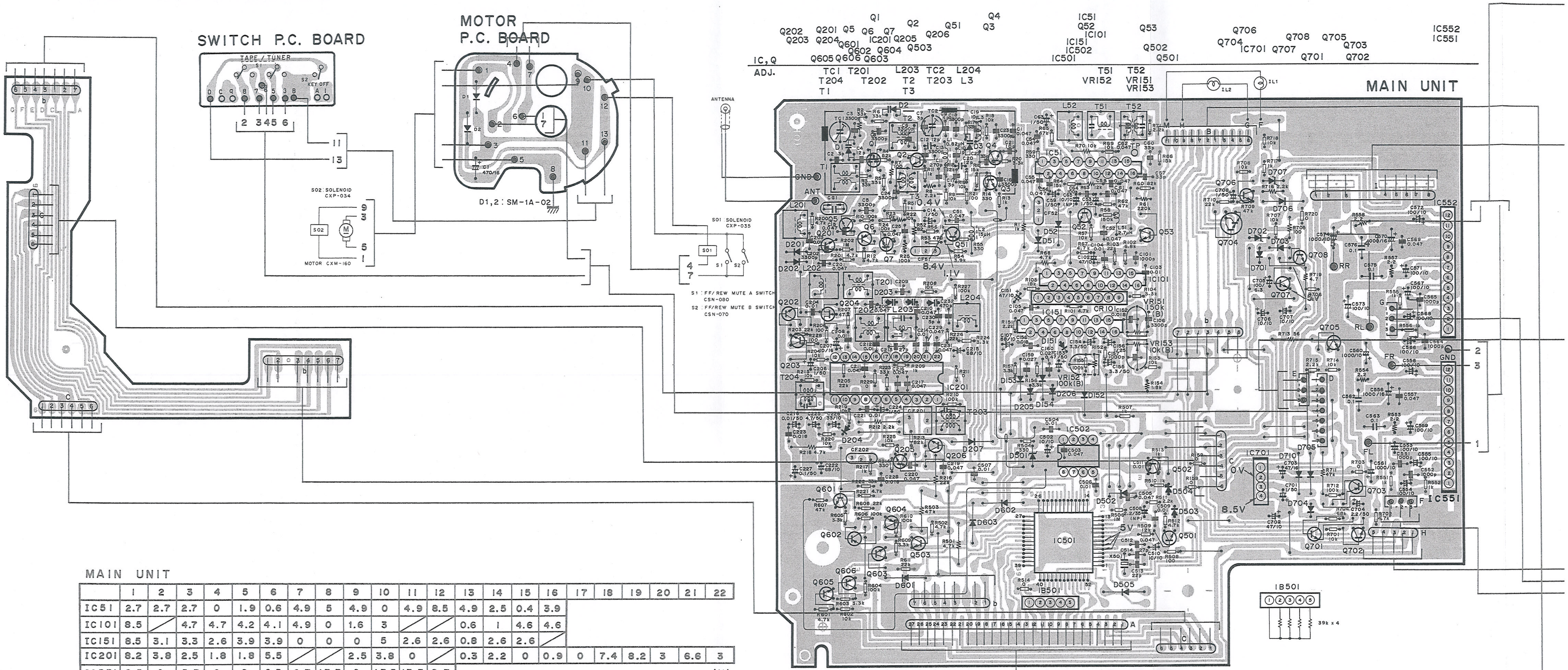
NOTE :

—▭— Indicates a chip resistor

—▮— Indicates a chip capacitor

Fig. 30

6. CONNECTION DIAGRAM


SWITCH P.C. BOARD
TAPE / TUNER
KEY OFF
MOTOR P.C. BOARD
D1,2 : SM-1A-02
C1 470/16
S02 : SOLENOID CXP-034
MOTOR CXM-160
S01 : SOLENOID CXP-035
S1 : FF/REW MUTE A SWITCH CSN-080
S2 : FF/REW MUTE B SWITCH CSN-070
ANTENNA
IC, Q
Q202 Q203 Q201 Q204 Q5 Q6 Q7 Q1 Q601 Q602 Q604 Q605 Q606 Q603 IC201 Q205 Q2 Q503 Q206 Q51 Q4 Q3
IC51 Q52 IC101 IC151 IC502 IC501 Q53 Q502 Q501 Q706 Q704 IC701 Q707 Q708 Q705 Q703 Q701 Q702 IC552 IC551
ADJ.
TC1 T204 T1 T201 T202 L203 T2 T3 TC2 T203 L204 L3 T51 VR152 T52 VR151 VR153
MAIN UNIT
IL1
IL2
GND
ANT
IB501
39k x 4

MAIN UNIT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
IC51	2.7	2.7	2.7	0	1.9	0.6	4.9	5	4.9	0	4.9	8.5	4.9	2.5	0.4	3.9						
IC101	8.5	/	4.7	4.7	4.2	4.1	4.9	0	1.6	3	/	/	0.6	1	4.6	4.6						
IC151	8.5	3.1	3.3	2.6	3.9	3.9	0	0	0	5	2.6	2.6	0.8	2.6	2.6	/						
IC201	8.2	3.8	2.5	1.8	1.8	5.5	/	/	2.5	3.8	0	/	0.3	2.2	0	0.9	0	7.4	8.2	3	6.6	3
IC551	0.5	0	5.3	0	0	0.5	6.7	13.3	0	13.5	13.3	6.7										

(V)

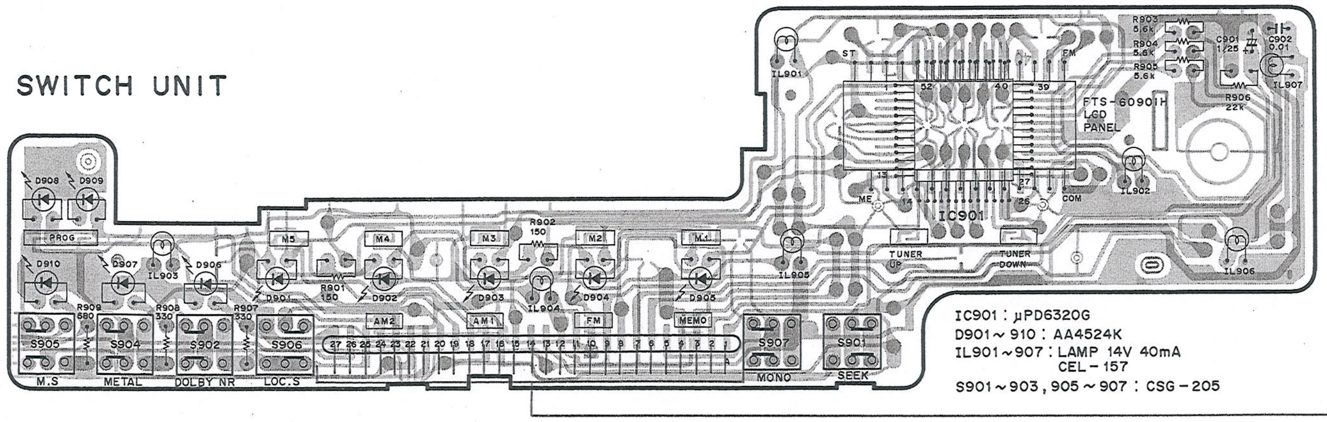
IC51 : LA1140B
IC101 : LA2110
IC151 : LA3376P
IC201 : PA3016
IC501 : PD4044
IC502 : μPB553AC
IC551, 552 . HA1398
IC701 : AN6540

Q1 : P001
Q2 : 2SC2786
Q3, 4, 51, 205 : 2SC2787
Q5, 7, 52, 53, 201~203, 501,502,601, 603, 605, 702,
Q706, 708 : 2SC2458
Q6, 703 : 2SA1048
Q206, 503, 701 : 2SC3113
Q704 . 2SD1276
Q204 : 2SK163
Q602, 604, 606 : 2SB822
Q705, 707 : 2SD1055F

D1~3 : 1SV101
D51, 52, 151~154, 201, 202, 204, 204 ~ 207, 503~505, 601~603,
D701, 703 ~ 706, 710 : US1040, 1S1555 or 1S2076
D203 : KV1235Z3
D501, 502, 702 : HZ5C1
D707 : HZ9A2

IC — IC901

SWITCH UNIT


IC901
FTS-6090IH LCD PANEL
COM
TUNER UP
TUNER DOWN
PROG
M.S
METAL
DOLBY NR
LOC.S
MONO
SEEK
M1
M2
M3
M4
M5
AM1
AM2
FM
MEMO
S901
S902
S904
S905
S906
S907
IL901
IL902
IL903
IL904
IL905
IL906
IL907
D901
D902
D903
D904
D905
D906
D907
D908
D909
D910

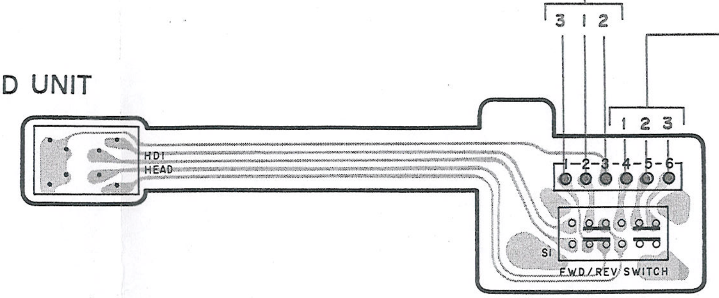
IC901 : μPD6320G
D901 ~ 910 : AA4524K
IL901 ~ 907 : LAMP 14V 40mA
CEL - 157
S901 ~ 903, 905 ~ 907 : CSG - 205

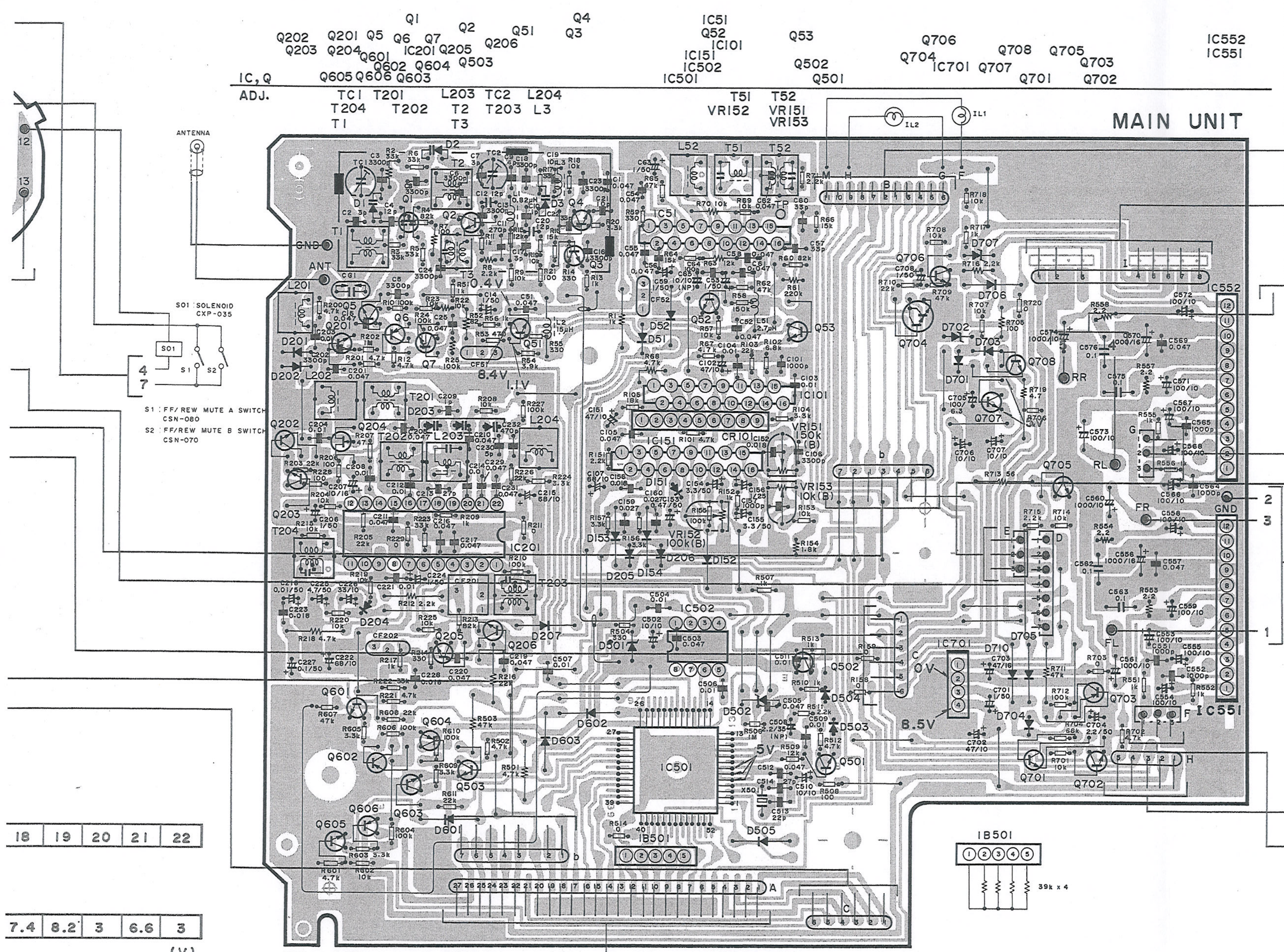
MAIN UNIT

	E	C	B
Q2	0.8	/	1.5
Q3	2.7	7.2	3.4
Q4	3.3	8.1	4
Q6	/	6.7	7.9
Q7	3.4	7.9	/
Q205	0.7	6.5	1.4

(V)

HEAD UNIT


3 1 2
1 2 3
HD1 HEAD
S1
FWD/REV SWITCH


3
4
5
6
IC, Q
ADJ.
Q202 Q203 Q201 Q204 Q5 Q601 Q6 Q602 Q1 Q7 IC201 Q604 Q2 Q205 Q503 Q206 Q51 Q4 Q3
Q605 Q606 Q603
TC1 T204 T1
T201 T202
L203 T2 T3
TC2 T203
L204 L3
IC51 Q52 IC101 IC151 IC502 IC501
T51 VR152
Q53 T52 VR151 VR153
Q502 Q501
Q706 Q704 IC701 Q708 Q707 Q705 Q701 Q703 Q702
IC552 IC551
MAIN UNIT
ANTENNA
GND
ANT
S01 SOLENOID CXP-035
S1 : FF/REW MUTE A SWITCH CSN-080
S2 : FF/REW MUTE B SWITCH CSN-070
IL1
IL2
FR
RR
RL
FL
GND
IB501
39k x 4

18	19	20	21	22
7.4	8.2	3	6.6	3

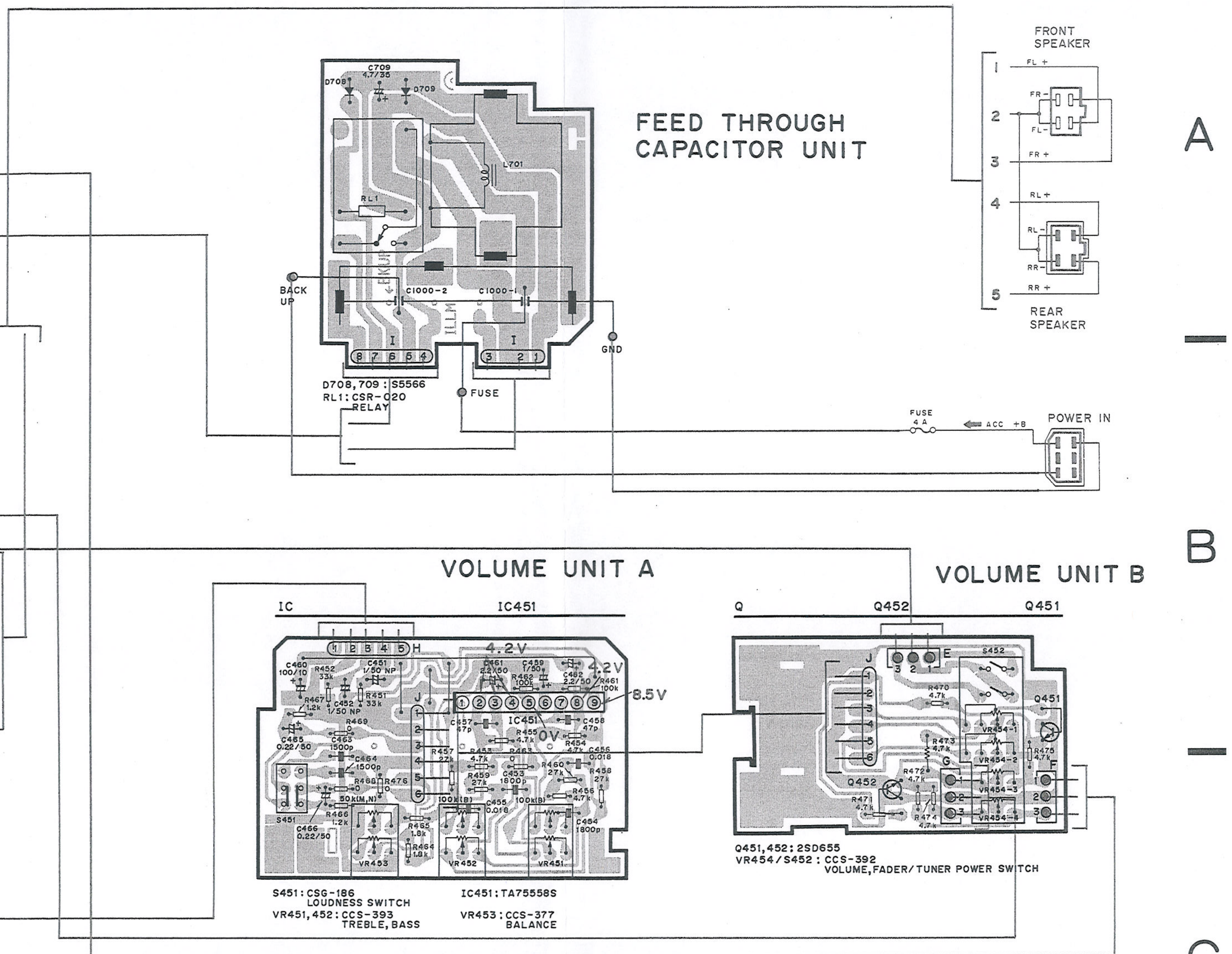
(V)

IC51 : LA1140B
IC101 : LA2110
IC151 : LA3376P
IC201 : PA3016
IC501 : PD4044
IC502 : μPB553AC
IC551, 552 . HA1398
IC701 : AN6540

Q1 : P001
Q2 : 2SC2786
Q3, 4, 51, 205 : 2SC2787
Q5, 7, 52, 53, 201~203, 501,502,601, 603, 605, 702,
Q706, 708 : 2SC2458
Q6, 703 . 2SA1048
Q206, 503, 701 : 2SC3113
Q704 . 2SD1276

Q204 : 2SK163
Q602, 604, 606 : 2SB822
Q705, 707 : 2SD1055F

D1~3 : 1SV101
D51, 52, 151~154, 201, 202, 204, 204 ~ 207, 503~505, 601~603,
D701, 703 ~ 706, 710 : US1040, 1S1555 or 1S2076
D203 : KV1235Z3
D501, 502, 702 : HZ5C1
D707 : HZ9A2


7
8
9
A
B
FEED THROUGH CAPACITOR UNIT
BACK UP
GND
FUSE
D708, 709 : S5566
RL1 : CSR-020 RELAY
FRONT SPEAKER
REAR SPEAKER
POWER IN
FUSE
ACC +B
VOLUME UNIT A
IC
IC451
4.2V
8.5V
VOLUME UNIT B
Q
Q452
Q451

S451 : CSG-186
LOUDNESS SWITCH
VR451, 452 : CCS-393
TREBLE, BASS

IC451 : TA75558S

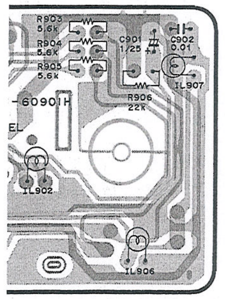
VR453 : CCS-377
BALANCE

Q451, 452 : 2SD655
VR454/S452 : CCS-392
VOLUME, FADER/TUNER POWER SWITCH

PRE DOLBY NR UNIT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IC251	1.3	0.7	1.8	8.5	0	1.8	0.7	1.3										
IC301	4.5	0.7	0.7	4.4	4.3	/	4.3	4.3	0	4.3	0	/	4.3	4.4	0.7	0.7	8.5	4.5
IC401	8.1	8.5	0	1	0	1.7	4.7	/	8.6									

(V)

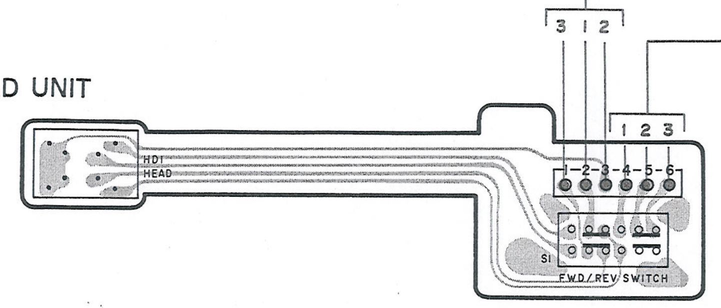


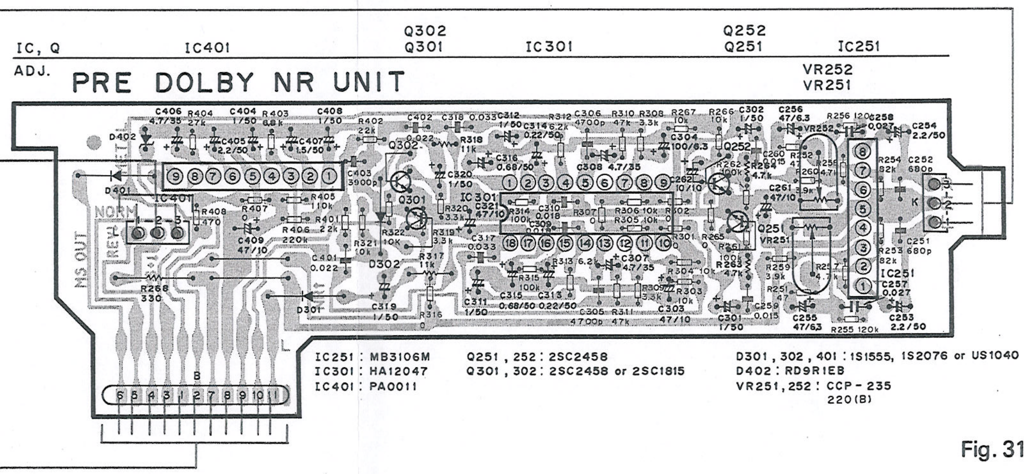
4K
14V 40mA
157
07 : CSG-205

MAIN UNIT

	E	C	B
Q2	0.8	/	1.5
Q3	2.7	7.2	3.4
Q4	3.3	8.1	4
Q6	/	6.7	7.9
Q7	3.4	7.9	/
Q205	0.7	6.5	1.4

(V)


HEAD UNIT
HD1
HEAD
3 1 2
1 2 3
1 2 3 4 5 6
S1
FWD/REV SWITCH


IC, Q
ADJ.
IC401
Q302 Q301
IC301
Q252 Q251
IC251
VR252 VR251
PRE DOLBY NR UNIT
NORM
REV
NS OUT
B
9 8 4 3 1 2 7 8 9 10 11
D

IC251 : MB3106M
IC301 : HA12047
IC401 : PA0011

Q251, 252 : 2SC2458
Q301, 302 : 2SC2458 or 2SC1815

D301, 302, 401 : 1S1555, 1S2076 or US1040
D402 : RD9R1EB
VR251, 252 : CCP-235
220(B)

Fig. 31

7. CABINET EXPLODED VIEW

• Parts List

Mark	No.	Part No.	Description
	1.	CXD-208	Case Unit
	2.	BMZ30P040FMC	Screw
	3.		Cushion
	4.	BMZ40P060FMC	Screw
	5.		Bracket
	6.		Bracket
	7.	CNM-572	Spacer
	8.	CXD-071	Button Unit
	9.		Lever
★	10.	CAC-702	Button
★	11.	CAA-537	Knob
	12.	CXD-298	Grille Assy
	13.	BMZ26P040FMC	Screw
	14.	CXD-207	Door Unit
	15.	CBH-684	Spring
★	16.	CAA-517	Knob
★	17.	CAA-516	Knob
	18.	BMZ26P050FMC	Screw
	19.		Spacer
	20.	CXK-515	Cassette Mechanism Assy
	21.	CNL-278	P.C. Board
	22.	CBA-106	Screw
	23.	BMZ23P025FMC	Screw
	24.		Cover
★ ★	25.	CSF-014	Switch (TAPE/TUNER)
	26.	BMZ20P040FMC	Screw
★ ★	27.	CSN-071	Switch (KEY OFF)
	28.	CXC-743	Bracket Unit
	29.	YE15FUC	Washer
	30.		Arm
	31.	CBH-680	Spring
	32.	CDF-666	Connector
	33.		Stud
	34.		Bracket
★	35.	CAC-799	Button
★	36.	CAC-800	Button
	37.		Bracket
	38.		Bracket
	39.		Stud

• Cabinet

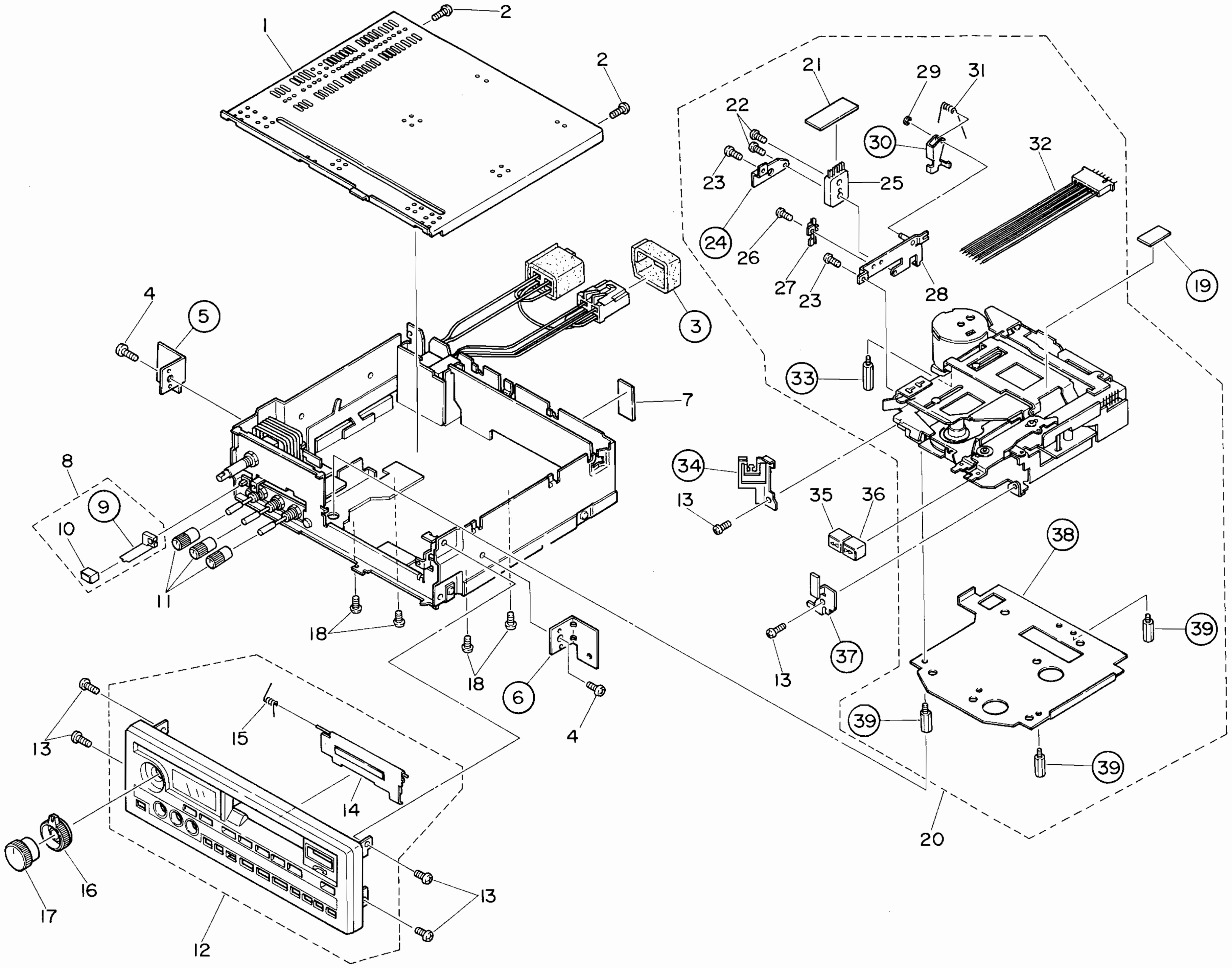


Fig. 32

8. MAIN

• Parts List

NOTE:

- *For your Parts S*
  ★ ★ and ★.
  ★ ★: GENERAL
  This classificatio
  number, tempera
- *Parts whose part*

Mark	No.	Part N
	1.	
★ ★	2.	CCS-3
	3.	CDF-6
	4.	CKS-2
	5.	CDF-9
	6.	
	7.	
	8.	
★ ★	9.	CSG-1
★ ★	10.	CCS-3
★ ★	11.	CCS-3
	12.	
	13.	NK60F
	14.	
	15.	
	16.	CNW-
	17.	
	18.	
	19.	FTS-6
	20.	
	21.	
★ ★	22.	CEL-1
	23.	CNW-
	24.	BTN20
	25.	CNW-
★	26.	AA452
★ ★	27.	CSG-2
★	28.	CAC-7
	29.	CNW-
★	30.	CAC-5
★	31.	CAC-7
	32.	
★	33.	CAC-7
	34.	PMZ2
	35.	CNL-5
	36.	
	37.	
	38.	BMZ3
	39.	BMZ3
	40.	

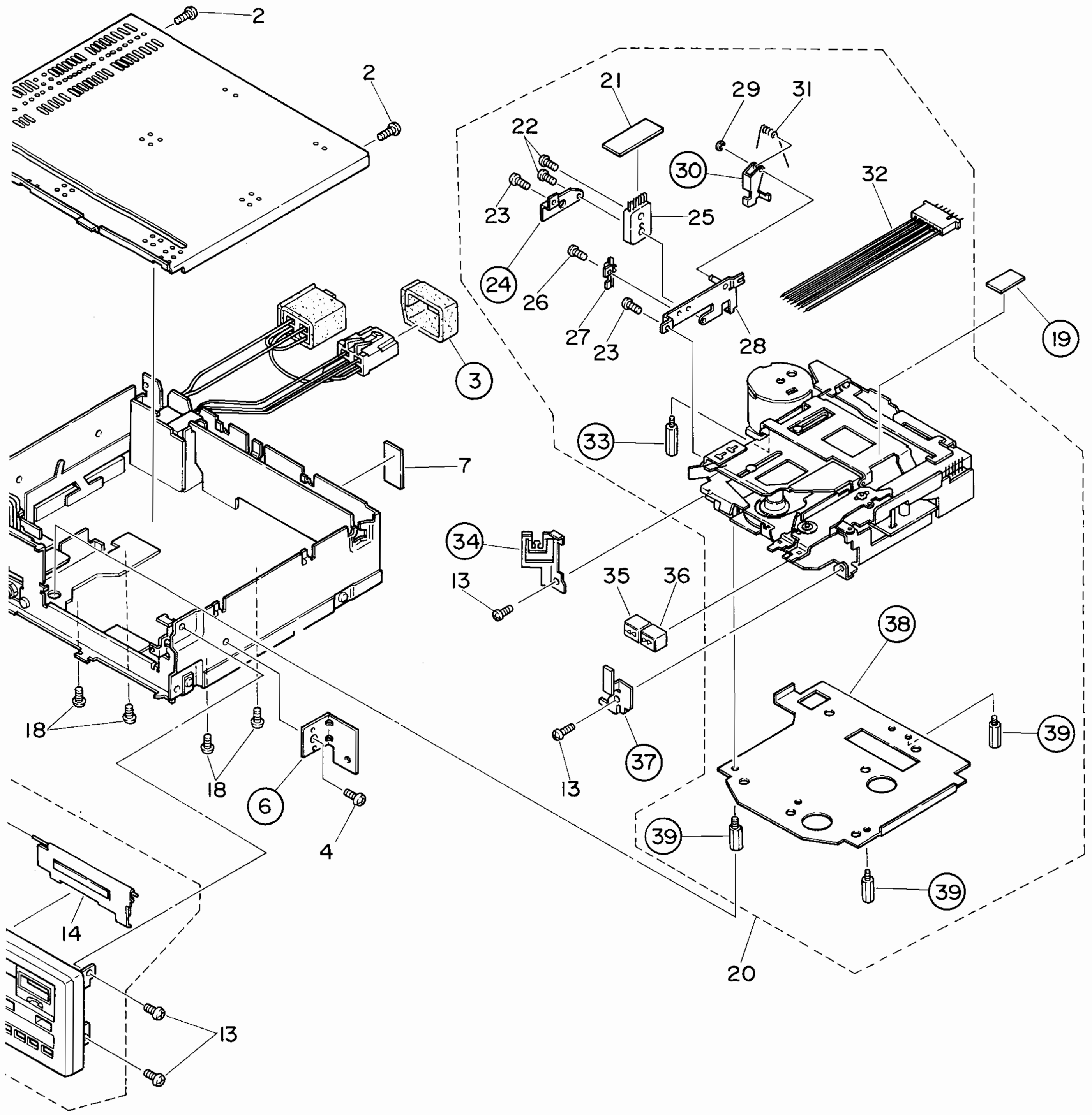


Fig. 32

8. MAIN ASSY (CWE-643) EXPLODED VIEW

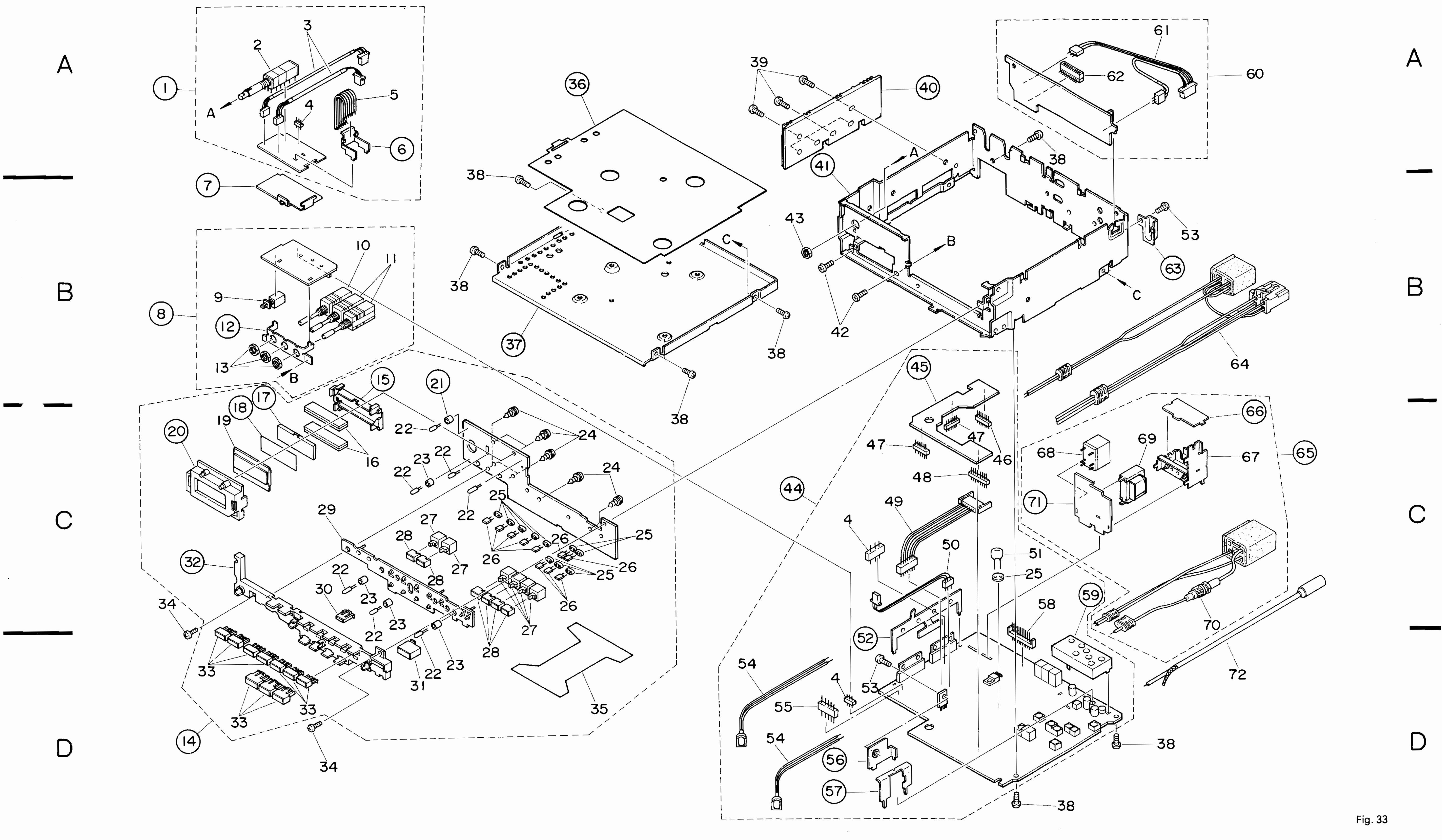
- **Parts List**

NOTE:

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Mark	No.	Part No.	Description
	1.		Volume Unit B
★ ★	2.	CCS-392	Volume/Switch
	3.	CDF-650	Connector
	4.	CKS-291	Plug
	5.	CDF-911	Connector
	6.		Bracket
	7.		Insulator
	8.		Volume Unit A
★ ★	9.	CSG-186	Switch
★ ★	10.	CCS-377	Volume
★ ★	11.	CCS-393	Volume
	12.		Holder
	13.	NK60FUC	Nut
	14.		Switch Unit
	15.		Holder
	16.	CNW-495	Connector
	17.		Lens
	18.		Plate
	19.	FTS-6091H	LCD
	20.		Holder
	21.		Spacer
★ ★	22.	CEL-157	Lamp, 14V 40mA
	23.	CNW-506	Holder
	24.	BTN20P060FMC	Screw
	25.	CNW-549	Spacer
★	26.	AA4524K	LED
★ ★	27.	CSG-205	Switch
★	28.	CAC-702	Button
	29.	CNW-803	Rubber
★	30.	CAC-556	Button
★	31.	CAC-703	Button
	32.		Holder
★	33.	CAC-704	Button
	34.	PMZ26P060FMC	Screw
	35.	CNL-597	P.C. Board
	36.		Insulator
	37.		Case
	38.	BMZ30P040FMC	Screw
	39.	BMZ30P080FMC	Screw
	40.		Heat Sink
	41.		Chassis
	42.	BMZ26P040FMC	Screw
	43.	NK70FUC	Nut
	44.		Main Unit
	45.		P.C. Board
	46.	HKS-132	Plug
	47.	CKS-294	Plug
	48.	CKS-295	Plug
	49.	CDF-731	Connector
	50.	CDF-625	Connector
	51.	CSZA010M25	Capacitor
	52.		Bracket
	53.	BMZ30P060FMC	Screw
★ ★	54.	CEL-158	Lamp, 14V 40mA
	55.	CKS-194	Plug
	56.		Bracket
	57.		Shield
	58.	CKS-496	Plug
	59.		Case
	60.	CWK-346	Pre Dolby NR Unit
	61.	CDF-668	Connector
	62.	CKS-515	Connector
	63.		Clamper
	64.	CDF-825	Connector
	65.		Feed Through Capacitor Unit
	66.		Bracket
	67.	CCL-131	Feed Through Capacitor
	68.	CSR-020	Relay
	69.	CTF-208	Coil
	70.	CDF-827	Connector
	71.		P.C. Board
	72.	CDH-094	Antenna Cable

- **Main Assy (CWE-643)**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52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
A
B
C
D

Fig. 33

9. ELECTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10^1 561 .... RD1/4PS $\boxed{5}\boxed{6}\boxed{1}$ J
47kΩ 47 × 10^3 473 .... RD1/4PS $\boxed{4}\boxed{7}\boxed{3}$ J
0.5Ω 0R5 .... RN2H $\boxed{0}\boxed{R}\boxed{5}$ K
1Ω 010 .... RS1P $\boxed{0}\boxed{1}\boxed{0}$ K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10^1 .... RN1/4SR $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ F

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Pre Dolby NR Unit (CWK-346)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★ ★	IC251		MB3106M
★ ★	IC301		HA12047
★ ★	IC401		PA0011
★ ★	Q251, Q252, Q301, Q302		2SC2458 or 2SC1815
★	D301, D302, D401		1S1555 or 1S2076 or US1040
★	D402		RD9R1EB
★ ★	VR251	Semi-fixed, 220 Ω (B)	CCP-235

RESISTORS

Mark	Symbol & Description	Part No.
	R251 — R262, R265 — R267, R301 — R316, R319 — R322, R401 — R408, Chip Resistor	RS1/8S☐☐☐J
	R263, R264	RD1/6VS☐☐☐J
	R268, R317, R318	RD1/4PM☐☐☐J

CAPACITORS

Mark	Symbol & Description		Part No.
	C251, C252	Chip Capacitor	CKSYB681K50
	C253, C254		CEANL2R2M50LL
	C255, C256		CEA470M6R3LS
	C257, C258		CQMA273J50L
	C259, C260	Chip Capacitor	CKSYB153K50
	C261		CEA470M10LS
	C262		CEA100M10LS
	C301, C302, C311, C312, C319, C320		CEA010M50LS
	C303		CEA470M10LS
	C304		CEA101M6R3LS
	C305, C306	Chip Capacitor	CKSYB472K50
	C307, C308		CEA4R7M35LS
	C309, C310	Chip Capacitor	CKSYB183K25
	C313, C314		CEAR22M50LS
	C315, C316		CEAR68M50LS
	C317, C318	Chip Capacitor	CKSYB333K25
	C321		CEA470M10LS
	C401, C402	Chip Capacitor	CKSYB223K25
	C403	Chip Capacitor	CKSYB392K50
	C404, C408		CEA010M50LS
	C405		CEA2R2M50LS
	C406		CEA4R7M35LS
	C407		CEA1R5M50LS
	C409		CEA470M10LS

Main Unit

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★ ★	IC51		LA1140B
★ ★	IC101		LA2110
★ ★	IC151		LA3376P
★ ★	IC201		PA3016
★ ★	IC501		PD4044
★ ★	IC502		μPB553AC
★ ★	IC551, IC552		HA1398
★ ★	IC701		AN6540
★ ★	Q1		P001
★ ★	Q2		2SC2786
★ ★	Q3, Q4, Q51, Q205		2SC2787
★ ★	Q5, Q7, Q52, Q53, Q201 — Q203, Q501, Q502, Q601, Q603, Q605, Q702, Q706, Q708		2SC2458
★ ★	Q6, Q703		2SA1048
★ ★	Q204		2SK163
★ ★	Q206, Q503, Q701		2SC3113
★ ★	Q602, Q604, Q606		2SB822
★ ★	Q704		2SD1276
★ ★	Q705, Q707		2SD1055F
★	D1 — D3		1SV101
★	D51, D52, D151 — D154, D201 D202, D204 — D207, D503 — D505, D601 — D603, D701, D703 — D706, D710		US1040 or 1S1555 or 1S2076
★	D203		KV1235Z3
★	D501, D502, D702		HZ5C1
★	D707		HZ9A2
	L1	Coil	CTF-181
	L2	Ferri-Inductor	CTF-156
	L3	Coil	CTC-114
	L51	Ferri-Inductor	CTF-155
	L52	Coil	CTC-144
	L201	Coil	CTB-149
	L202	Coil	CTB-144
	L203	Filter	CTF-222
	L204	Coil	CTB-143
	T1	Coil	CTC-113
	T2	Coil	CTC-116
	T3	Coil	CTC-117
	T51	Coil	CTC-132
	T52	Coil	CTC-133
	T201, T202	Coil	CTB-150
	T203, T204	Coil	CTE-156
	TC1, TC2	Trimmer	CCG-069
★ ★	VR151	Semi-fixed, 150 kΩ (B)	CCP-252
★ ★	VR152, VR153	Semi-fixed, 10 kΩ (B)	CCP-245
	X501	X'tal	CSS-022
	IB501	Resistor Array	CWW-037
	CF51, CF52	Ceramic Filter	CTF-101
	CF201	Filter	CTF-100
	CF202	Filter	CTF-223
	CR1	Capacitor (with discharge gap)	CCL-068
			CWW-107
★ ★	IL1, IL2	Lamp, 14V 40 mA	CEL-158

RESISTORS

Mark	Symbol & Description	Part No.
	R1, R63, R70, R212, R216, R218, R501, R503, R711, R713, R719	RD1/4PM☐☐☐J
	R2, R8, R22, R25, R61, R68, R553, R554, R557, R558	RD1/6VS☐☐☐J
	R3 — R6, R9 — R21, R23, R24, R51, R53 — R60, R62, R64 — R67, R69, R71, R101 — R105, R151 — R153, R155 — R159, R200 — R211, R213 — R215, R217, R219 — R229, R502, R504, R506 — R514, R551, R552, R555, R556, R601 — R611, R701 — R704, R706 — R710, R712, R714, R715, R717, R718, R720 Chip Resistor	RS1/8S☐☐☐J
	R7, R52, R154, R505, R705, R716	RD1/6PS☐☐☐J

CAPACITORS

Mark	Symbol & Description		Part No.
	C1, C15, C25	Chip Capacitor	CKSYB473K25
	C2, C7	Chip Capacitor	CCSSH030C50
	C3, C5, C6, C8, C13, C16, C18, C23, C24	Chip Capacitor	CKSYB332K50
	C4	Chip Capacitor	CCSSH120J50
	C9	Chip Capacitor	CCSCH040C50
	C10	Chip Capacitor	CCSCH010C50
	C11	Chip Capacitor	CCSCH271J50L
	C12		CCDSH120J50L
	C14		CEA010M50LS
	C17	Chip Capacitor	CCSTH030C50
	C19, C21	Chip Capacitor	CCSTH100D50
	C20		CCDTH120J50L
	C22	Chip Capacitor	CCSSH330J50
	C51, C52, C54 — C56, C58, C61, C62	Chip Capacitor	CKSYB473K25
	C53, C59, C63		CEA010M50LS
	C57, C60	Chip Capacitor	CCSSL330J50
	C64	Chip Capacitor	CCSSL101J50
	C65		CEA100M10NPLL
	C101, C157	Chip Capacitor	CCSCH102J50
	C102		CEA470M10LS
	C103, C104	Chip Capacitor	CKSYB103K50
	C105	Chip Capacitor	CKSYB473K25
	C106	Chip Capacitor	CKSYB332K50

Mark	Symbol & Description	Part No.
	C107	CEA680M10LS
	C151	CEA470M10LS
	C152, C158 Chip Capacitor	CKSYB183K25
	C153	CEAR47M50LS
	C154, C155	CEA3R3M50LS
	C156	CSZA010M25
	C159, C160 Chip Capacitor	CKSYB273K25
	C201, C205, C210, C211, C216, C217, C219, C220, C229, C231 Chip Capacitor	CKSYB473K25
	C202 Chip Capacitor	CKSYB332K50
	C203, C204, C208, C212, C214, C221 Chip Capacitor	CKSYB103K50
	C206, C224	CEA010M50LS
	C207	CEA100M10LS
	C209 Chip Capacitor	CCSCH010C50
	C213 Chip Capacitor	CCSRH270J50
	C215, C222	CEA680M10LS
	C218, C227	CEA0R1M50LS
	C223, C228 Chip Capacitor	CKSYB183K25
	C225	CEA4R7M50LS
	C226	CEA330M10LS
	C230 Chip Capacitor	CCSCH050C50
	C232 Chip Capacitor	CCSSH471J50
	C502, C510	CEA100M10LS
	C503, C505, C512 Chip Capacitor	CKSYB473K25
	C504, C506, C507, C509, C511 Chip Capacitor	CKSYB103K50
	C508	CEA2R2M35NPLL or CEA2R2M50NPLL
	C513 Chip Capacitor	CCSCH220J50
	C514 Chip Capacitor	CCSCH270J50
	C551, C552, C564, C565 Chip Capacitor	CCSCH102J50
	C553 — C555, C558, C559	CEA101M10L2
	C556, C570	CEA102M16L2
	C557, C569 Chip Capacitor	CKSYB473K25
	C560, C561, C573, C574	CEA102M10L2
	C562, C563, C575, C576	CQFA104J50L
	C566 — C568, C571, C572	CEA101M10L2
	C701, C708	CEA010M50LS
	C702	CEA470M10LS
	C703	CEA470M16LS
	C704	CEA2R2M50LS
	C705	CEA101M6R3LS
	C706, C707	CEA100M10LS

Switch Unit

Mark	Symbol & Description	Part No.
★★	IC901	μPD6320G
★	LCD Display	FTS-6091H
★	D901 — D910 LED	AA4524K
★★	IL901 — IL907 Lamp, 14 V 40 mA	CEL-157
★★	S901 — S903, S905 — S907 Switch	CSG-205
	R901 — R906	RD1/6VS□□□J
	R907 — R909	RD1/6PS□□□J
	C901	CSZA010M25
	C902	CKDBC103K25

Volume Unit A

Mark	Symbol & Description	Part No.
★★	IC451	TA75558S
★★	S451 Switch	CSG-186
★★	VR451, VR452 Volume, 100 kΩ (B)	CCS-393
★★	VR453 Volume, 50 kΩ (M, N)	CCS-377
	R451 — R469, R476 Chip Capacitor	RS1/8S□□□J
	C451, C452	CEA010M50NPLL
	C453, C454 Chip Capacitor	CKSYB182K50
	C455, C456 Chip Capacitor	CKSYB183K25
	C457, C458 Chip Capacitor	CCSSL470J50
	C459	CEA010M50LS
	C460	CEA101M10LL
	C461, C462	CEA2R2M50LS
	C463, C464 Chip Capacitor	CKSYB152K50
	C465, C466	CEAR22M50LS

Volume Unit B

Mark	Symbol & Description	Part No.
★★	Q451, Q452	2SD655
★★	VR454/S452 Volume/Switch Volume, 20 kΩ (B), 50 kΩ (W)	CCS-392
	R470 — R472, R474, R475 Chip Resistor	RS1/8S□□□J
	R473	RD1/6PS□□□J

Feed Through Capacitor Unit

Mark	Symbol & Description	Part No.
★	D708, D709	S5566
	RL1 Relay	CSR-020
	L701 Coil	CTF-208
	C709	CEA4R7M35LS
	C1000 Feed Through Capacitor	CCL-131

Head Unit

Mark	Symbol & Description	Part No.
★★	HD1 Head	CPB-066
★★	S1 Switch (FWD/REV)	CSH-070

Switch P.C. Board

Mark	Symbol & Description	Part No.
★★	S1 Switch (TAPE/TUNER)	CSF-014
★★	S2 Switch (KEY OFF)	CSN-071

Motor P.C. Board

Mark	Symbol & Description	Part No.
★	D1, D2	SM-1A-02
	C1	CEA471M16L2

Miscellaneous Parts List

Mark	Symbol & Description	Part No.
★★	M Motor	CXM-160
★	SO1 Solenoid	CXP-035
★	SO2 Solenoid	CXP-034
★★	S1 Switch (FF/REW MUTE A)	CSN-080
★★	S2 Switch (FF/REW MUTE B)	CSN-070

10. PACKING METHODE

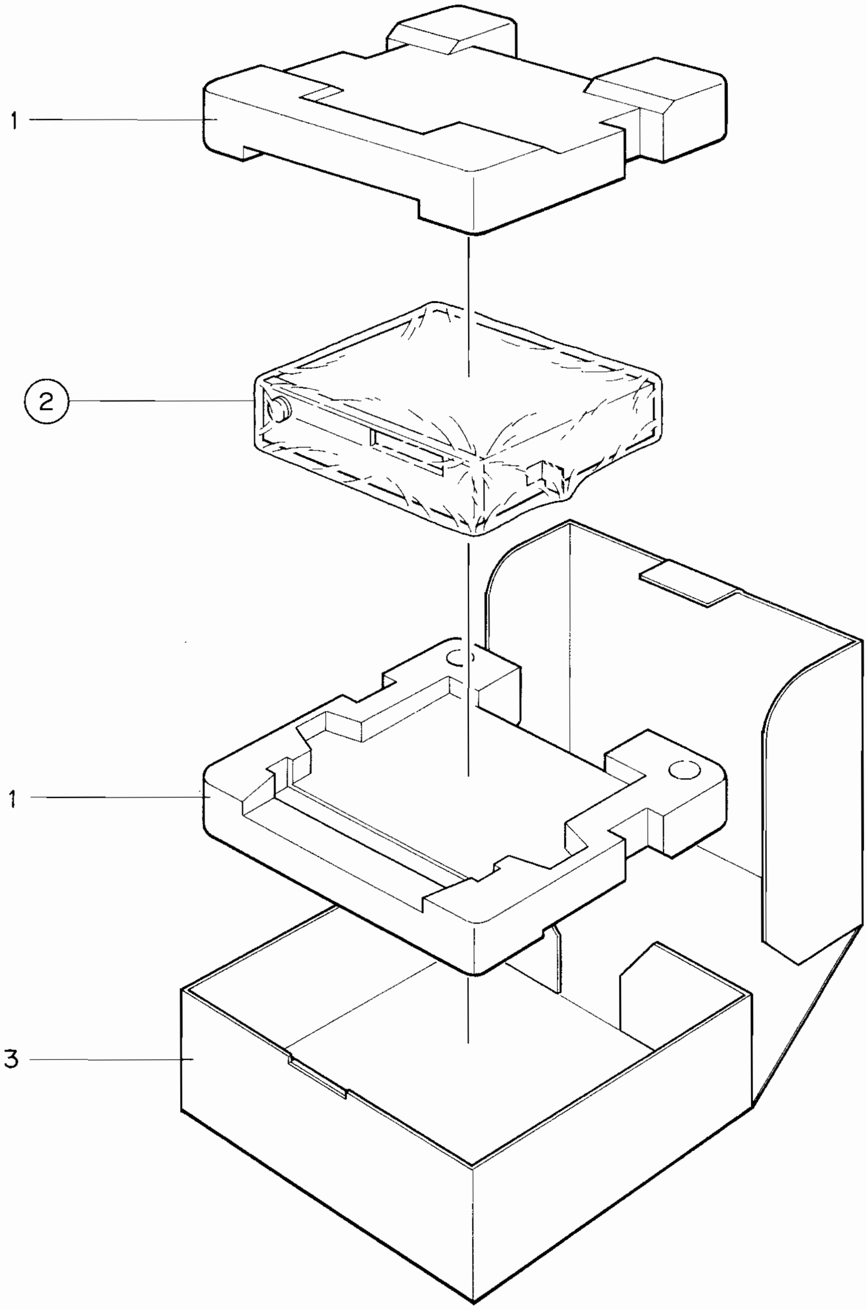

Fig. 34

• Parts List

Mark	No.	Part No.	Description
	1.	CHD-585	Styrofoam
	2.		Cover
	3.	CHD-587	Carton